

# THE IRON AGE

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## Business Preparedness Is the Order of the Day

**I**NDUSTRY has passed through the cycle of hope, disappointment, disillusionment and resignation.

The current depression was first mistaken for a mere recession, such as occurred in 1924 and 1927. This error was not prevented by industry's schooling in statistics following the business collapse of 1921. On the contrary, chart consciousness encouraged the belief that organized effort could warp the curve of the business cycle into the direction of recovery.



**I**T was with this end in view that captains of industry were rallied under Presidential leadership, but, when the results of their united action failed to measure up with expectations, it dawned upon the country that it was facing no mean downturn in business, and that the lessons of index numbers had not been well learned. It became clear that not enough attention had been paid to excesses in business that had been obscured by stock market speculation.

But it may be well that this realization was belated; the Washington conferences, though falling short of their objective, nevertheless cushioned the shock of the Wall Street crash.



**T**HE sobering influence of unfulfilled expectations is not without compensations. Mills and factories are beginning to depend on self-help—they have given up waiting for outside aid. Economies dictated by grim necessity are fitting in with preparations for a more profitable basis of operations whatever conditions may be.

Preachments to "buy now" are not taken seriously; instead, further pressure is being put on making sales. It is realized that the cost of such effort is fully justified, if ensuing increases in production schedules reduce overhead expenses. It is recognized that buyers' conservatism, always overdone in a depression, can only be broken down by consistent, aggressive, intelligent merchandising.



**P**RESENT preparedness, fortunately, does not hinge on prompt or rapid recovery. Such a rebound does not seem to be in prospect. There are not the great deficiencies in consumer needs that helped to stimulate business following the 1921 slump. World conditions offer no early promise of that small increase in exports that is commonly the difference between poor and good business for the country as a whole.

The best augury is that American business has steeled itself to face the unvarnished facts.

As President Schwab so aptly put it in addressing the American Iron and Steel Institute, industry is not concerned with "short-term pessimism"; nor is it over-anxious about the exact date when orders will pile up on its doorsteps. It is taking advantage of slack conditions to put itself "in a more wholesome position in production, in distribution and in financial respects to profit by the expansion which will come sooner or later."

Industry is ready to speed up as and when demand warrants. The machine is being overhauled and improved. It will run to make a profit.

# Cost Policies to Meet

*An Executive Round Table*

*Conducted by John H. Van Deventer, Industrial Consultant, THE IRON AGE*

**I**N calling this conference to order, it may not be amiss to tell a story.

A frontiersman of covered wagon days, named Joe Cummings, was exceptionally fast of foot. Scouts, Indians, soldiers and fellow frontiersmen alike were left far behind by him in competition. He was the acknowledged running champion of the territory.

Having outclassed the available human competition, Joe conceived the desire to outrun a buffalo, and to shoot him with his Colt six-gun. Time after time he tried to accomplish this feat, only to find the quadruped too speedy. One day, however, while thus engaged Joe had the misfortune to stumble. When he regained his feet and started to look for his revolver in the nearby sage grass, he found that the buffalo had executed a sudden about-face and was charging him, head down at full tilt. Then ensued a foot-race in which Joe hung up a new record. He beat the buffalo. It was the first time, as he said, that he had had "a right proper incentive to show his real speed."

Industrial executives today, under the pressure of

necessity, are securing results that would have been considered impossible a year ago. We had some very definite proof of this in the previous IRON AGE Round Table, on Sept. 4, when a number of metal-working executives told this conference how they were putting the question mark to work in order to make a profit on reduced volumes.

Today, we are to hear from a number of executives who will carry the subject a step farther. They will



W. J. GREDE



J. M. ACKLIN

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**N**CESSITY is the mother of cost and expense reduction, as well as of invention. Her two powerful sons form an effective team which is quite capable of making successful headway even under depression conditions.

In today's Iron Age Executive Round Table, you will hear a number of capable metal-working executives tell about cost policies designed for cost and expense reduction and employment stabilization.

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# Today's Needs



J. S. DRILLETTE



J. T. CHIDSEY

## PARTICIPATING IN THIS IRON AGE CONFERENCE:

JOHN T. CHIDSEY, President,  
Veeder-Root, Inc.  
CHARLES E. MILLER, President,  
Michigan Steel Tube Products Co.  
W. J. GREDE, President,  
Liberty Foundry, Inc.  
JAMES M. ACKLIN, President,  
Acklin Stamping Co.  
J. S. DRILLETTE, Vice-President,  
Louisville Frog, Switch and Signal Co.  
F. C. CARY, Chief Engineer,  
Cary Manufacturing Co.

tell us of cost and other operating policies which were put into effect after the question mark had revealed the opportunities for cost control and expense reduction.

The first gentleman on our program today is the chief executive of a metal stamping works in Toledo, Ohio, who believes that the recent depression has provided management with a "right proper incentive" to show its real speed. We shall now have the pleasure of hearing from Mr. James M. Acklin, president of the Acklin Stamping Company.

**Mr. Acklin:** Our biggest economy has been effected in the reduction of indirect labor. When the situation really began to look serious and of extended duration, we had a temporary short-time shut down, during which we mentally took the position that we had no organization and no employees. Note that this was a mental attitude only, not discussed out loud, but it did have the result among our executives of making us consider our entire shop procedure. We found that we could to advantage eliminate many motions that we had previously thought necessary. We were able to redistribute the functions of various members of the organization resulting in most cases in the entire elimination of certain jobs. In addition, we instituted paper work and physical contacts that gave us a much more closely knit organization than we had ever had before.

It is, of course, not possible to measure the effects of these things accurately, because of the decrease in business, but we are surprised to find that, even under current conditions our percentage of overhead is no larger than it was during the peak period last year.

As an example of what this more closely knit organization has meant to us, we have noted a greatly increased tendency to take the machines to the work rather than take the work to the machines. This, of course, is an old axiom but we now find that we are applying it in a way that would have been thought extremely foolish even a few months back; for instance, we think nothing of moving three or four machines, weighing approximately 25,000 lb. each so as to get them into a production line that will be used for only two or three days, after which time the machines will have to be redistributed into other production lines. We find that we save so much money in the transportation of materials and in the elimination of helpers that the moving expense is a negligible item.

As another example of close contact in the organization, we have so arranged our time keeping and cost keeping that, by noon on Tuesday the production department executives are in possession of exact information as to the cost of die and tool repairs that were incurred on the previous day. They are required to justify and approve of such expenditures in spite of the fact that the money is spent in a department



not under their control. Correspondingly in our die shop, where we make the dies, we hold the foremen responsible for die try-out, although the try-out work is actually performed by die setters in the press shop. All of this time is chargeable to the die shop however, so that here again they give to the die shop exact information by ten o'clock the following day so that they can justify and approve the expenditures.

Our inventories have been sharply reduced by close attention to detail, by refraining from ordering items of any size unless a definite need were shown and until after it is definitely shown that we do not have corresponding items in our warehouse that would function as well. Our raw material has, of course, been reduced in proportion as our business has decreased, which has followed automatically since we do not order steel until we get orders from our customers. Certain other items such as oils, cap screws, files, raw material for the manufacture of dies and tools, etc., have attained smaller inventories merely because of our refusal to order anything except the smallest possible package, and only one of those, even though this might mean repeating the order every week.

The conclusion that we reached from our current efforts regarding overhead, planning, etc., has been that we (and presumably our competitors) have been extremely wasteful and careless in the past. The economies that we have now effected could have been reached just as well a couple of years ago if we had not been hurried and consequently thoughtless. We do not feel today we have to have the enormous volume of production that we had a year and a half ago, but on the contrary feel that a very slight increase in the present volume of business will produce reasonable profits.



There is a good deal of food for thought in what Mr. Acklin has just told us. Necessity has opened the eyes of many executives to inefficiencies that they could not have seen and would not have admitted to exist a year ago. As a result many set ideas of long standing are being discarded and new ones adopted.

Take, for example, the idea of moving heavy production machinery into a special production line for just a few days run of work, as Mr. Acklin tells about doing. This is a new idea as applied to a light product of moderate size requiring heavy production equipment. It is such an interesting one that we have asked Mr. Acklin to give you the detailed particulars of it in a forthcoming issue of *THE IRON AGE*.

One way to adjust one's business to present-day conditions is to bring costs and overhead down to the point that will show a profit with decreased volumes. It is surely sound policy to press toward that end. In some cases, however, it may not be advisable to accept the idea of reduced volumes as inevitable. Price inducements and selling pressure will perhaps lift the volume sufficiently to make the profit margin reappear, even with lower selling price levels. This, in effect, was the policy pursued by the Cary Manufacturing Co., of Waupaca, Wis., manufacturers of oil-burners, humidifying apparatus, water heaters, etc. The chief engineer of that company, Mr. F. C. Cary, will now tell us how his company put this policy into effect, and

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## SUGGESTIVE EXECUTIVE

- 1—Is our percentage overhead higher than it was a year ago? If so, which items have increased, in proportion to our direct labor?
  - 2—Are these increased items of a fixed nature? If not, must we admit that they are irreducible?
  - 3—How long will it take today's operating performance to receive executive scrutiny? Can we reduce this elapsed time and get closer control?
  - 4—Are we notifying our foremen promptly and regularly of any variation from standard costs? Are we giving them regular reports showing overhead items controllable by them, and their variations?
  - 5—Have we established a normal percentage of scrap for various operations and a means of checking excesses?
  - 6—Is it feasible for us to secure a daily profit and loss sheet for our operations, such as Mr. Miller tells about?
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the remarkable results that were achieved through it.

**Mr. Cary:** The question of reduction of overhead came up at our January meeting and we came to the conclusion there was very little paring of expenses that could be done. On the other hand, if our sales were going to decrease and our production was reduced, our costs would increase and with increased cost we would either have to lose our profit or increase our price. Neither of these policies, we thought, was advisable. We decided that we could not cut our organization and reduce our overhead and yet maintain an efficient organization for manufacturing. We were also of the opinion that there would be a reduction in sales unless a greater inducement could be offered to the buyer to overcome the business conditions. If the inducement offered was only sufficient to maintain our present rate of production, we could not expect to do more than our former volume of business at a lower profit. Possibly, indeed, our profit might disappear through such an effort to keep our organization together. On the other hand, we felt that if a greater price inducement was made, it might increase our production to where we could lower our cost of production and lower our pro-rata overhead per unit of production. We pursued the latter course.

We decided upon greater sales effort, increased our purchasing of advertising material from 10,000 copies to 50,000 copies at a time, and organized a more intensive sales department. We have run four sales schools of five days each for our organization at the factory, training our men in the methods of produc-



## QUESTIONNAIRE

- 7—Mr. Acklin finds it profitable to move heavy production equipment to suit lots running for three or four days. Have we considered this possibility?
- 8—Are we getting our foundry costs as a flat pound average or by pattern? Would it help us to join one of the Gray Iron Institute groups?
- 9—Is a group bonus more beneficial to our labor when wages are high and we are operating full time, or held in reserve as a means of unemployment insurance?
- 10—Have we weak spots in our parts inventory which could be balanced profitably now and thus help the employment situation?
- 11—If business picks up suddenly, will it find us with a lot of uncompleted maintenance work? Have we worked out a comprehensive maintenance and replacement program?
- 12—Are we taking diminished sales as unpreventable, or making an aggressive sales promotion drive to overcome increased resistance?

tion, educating them in the operating of our equipment and have turned out salesmen who are very much better equipped and qualified to represent our company.

We further developed an educational department consisting of college trained women to acquaint the public with the necessity of air conditioning, burning the bacteria out of the air, increasing the oxygen content of the air, increasing the humidity, and reducing the dust and gases and odors in the air. Eight months have gone by of this try-out, and our increase in sales over last year is 117 per cent. We are doing more than double the business but on a smaller margin. However, we have been able to keep our entire organization going at full tilt. In fact, for six weeks our plant has been operating until nine o'clock three nights a week.

We also decided that it was necessary to do as much of our own manufacturing in our own plant as was possible; to buy the raw materials and manufacture them ourselves instead of buying certain parts from different manufacturers. This also necessitated additional machinery. We are now manufacturing every part that goes into our equipment except the electric motor and everyone of these instances of manufacturing is now below the cost of purchasing the same goods even after adding a portion of the overhead to the cost. As a result, our overhead is now being spread out over a very much larger volume of business. The cost of overhead per unit of production has

been reduced nearly half. In the purchase of machinery this year we have made it a practice to inquire what price was charged for the same machine a year ago, and in every instance where there had been no concession in price this year we have refused to buy the equipment and have either built it or bought old equipment and remodelled it to meet our needs.

After seven months' experience, we are convinced that we did the right thing. We have practically doubled our sales without increasing our overhead and are doing a large volume of business at a smaller margin. We believe that if other manufacturers would make price concessions, they could increase the business volumes and aid the present condition.



Doubling one's volume of sales under present-day and recent conditions is no mean achievement. Mr. Cary has given us something to think about. Incidentally, let me say that we find a surprisingly large number of concerns in the metal-working field that have actually increased their volumes over last year, and in branches of the industry that have not, as a whole, been excepted from the effects of the depression. Perhaps the less aggressive concerns in these branches have lost volume in proportion to what the more aggressive ones have gained. It is the old law of survival of the fittest which comes to the front at these times.

One aspect of the present situation is the tendency of forward looking executives to hold their organizations together and to search for ways and means to help tide their employees over the hard times. This is good business as well as humanitarian practice, because when the pick-up comes

organizations that have been emasculated will be difficult to build up and the process will be costly.

A very original method of dull time relief has been worked out by the Louisville Frog, Switch and Signal Co. of Louisville, Ky. It operates on the general principle that group bonus, earned in good times may be utilized as unemployment insurance in dull times. We have asked Mr. J. S. Drillette, vice-president of that company, to tell us some of the details of this plan.

**Mr. Drillette:** Under present conditions, practically every concern shows reduction in inventory as compared with last year, and therefore quicker turnovers. Better machinery also has generally been added and we find that advertising costs and sales expenses, which have heretofore increased rapidly, are now being questioned. Also, it is not any longer being taken for granted that any article can be sold by using just any kind of advertising. We have found, too, that far more attention is generally being paid to the matter of turnover in the organization. This is important, for the breaking in of a new man when business picks up often costs considerably more than carrying the old man through the dull period.

In line with this last thought we are making a change in our bonus payment to shop employees so that instead of their receiving a bonus when they are getting full time (which is the only time when they



can earn a bonus), we are instead changing this payment so as to be given them during the dull period or when a man makes less than four days or thirty-six hours of the regular weekly pay period. I believe you will all agree that bonus has been used in the past to increase production when business is at its best and therefore to increase the wages of the shop men when these wages were at the best.

What we are doing is substantially to make the bonus, earned in good times, provide a fund which will help to tide over our labor in bad times.

We now call our system "bonus reserve" and it includes sick payments as well as accident payments, which apply before the Workmen's Compensation Act is effective.

Since ours has been a group bonus system and each man has earned practically the same amount of bonus, we will not endeavor to credit each man with that particular amount in the future, but will keep it in reserve to apply to him only if he comes within the rules by being sick or injured or does not make at least four days per week.

Some of the details of our plan may be of interest to you at this time. I will mention a few of them.

It is felt that employees making four days (36 hours) should be able to get along, especially if they save a little during the full time season, and are as conservative as they should be with their money, therefore no bonus will be paid to any employee making 36 hours during any pay period. Thirty-six hours of work during a pay period therefore means no bonus payment.

Any employee, who only through the company's instruction, earns less than 36 hours' pay will be paid from "bonus reserve" at the rate of 21 cents per hour for the total time he is off during that period.

Five days of nine hours each and one day of five hours will be considered a full period.

Here are some examples of the practical application of this plan:

Charlie works one day (nine hours) only. He draws, then, nine hours' pay, also a bonus from reserve on 41 hours laid off at 21 cents or \$8.61 for the week. At this rate, which would represent a very poor season, he could be helped over nearly seven weeks of a dull period—according to last year's bonus.

Again, if he worked 18 hours he would draw his bonus reserve on 32 hours at 21 cents or \$6.72, which could be continued for about 8½ weeks on our last year's basis.

Again, if he worked 27 hours, which is the usual time made in our dull season, he would receive from "bonus reserve" 23 hours at 21 cents or \$4.83. This payment would, on last year's basis of earned bonus (\$55.00 per man), allow better than 11 weeks' help, which is about all that is needed.



The above rates have been made so that, if possible, there will always be a "bonus reserve" for emergency. The rates will be increased by the company only after the "bonus reserve" exceeds \$2,000. These payment rates will be decreased if it is found there is no balance on hand after the dull season. The first test of rates will be during 1931, and by October of that year we will have a fair estimate as to how

our schedule of rates is working out.

The company has absolutely no responsibility for payments except where there actually is money in the "bonus reserve" and then only in the amount of this reserve. No payments will be made until, and only when, there is a reserve. There will be no accumulation of charges or payments to be made from bonus that may be earned. It must be there before it is paid (no advances).

Since no payments will be made to anyone according to the amount of bonus he would have normally received, all the above acts only as insurance while in the company's employ, and if one leaves or is discharged he has nothing due him from the bonus reserve.

It is our thought that such a system will hold our men closer to the company; although there may be some slight tendency toward their earning less bonus due to the fact that it is not receiving in bulk shortly after they actually earn it; however, there has been such a hard lesson taught to most men who have gone through the recent period that we feel they will appreciate our plan and consider it as good an investment as any type of insurance.

Locking the barn door before the horse is stolen is pretty good managerial policy as applied to the cost of production. Cost data and records which come to executive attention too late to be of anything but historical value, are not of great service under present-day conditions. However, if cost data can be given to the manufacturing department in time to prevent losses, we have an ideal condition for the establishment of effective control.

The Michigan Steel Tube Products Co. of Detroit has established cost practice which provides this timely control. It has found it of great value in helping the management to plot and steer a safe course amid the shoals of depression. We have asked Mr. Charles E. Miller, president of that company, to tell us about his cost methods and practice.

**Mr. Miller:** Early in its history Michigan Steel Tube Products Co. recognized the importance of standardizing costs on its productive operations. Cost records at that time were nothing more than history; a record of what had been done; a revelation of where profits and losses had been taken on jobs already completed and sold.



How to make the cost department an aid to the manufacturing department and justify its existence was the problem. Could cost data be given the manufacturing department in time to prevent losses? With this in mind the management installed, in 1923, a standard cost system. Time studies were taken of each operation performed on a piece of tubing. Production per hour was set up as a standard by which the operator could be gaged, and from this basis costing is done as follows:

A standard estimate sheet is prepared by the estimating department from production methods and this standard remains constant until a revision in manufacturing or raw material requires a change. The estimate records the necessary operations to be done on the tube, the production per hour and the direct labor cost per unit. In addition the amount of waste or scrap in making the part is standardized from previous experience in tube making as also the necessary repairs to recondition defective material or workmanship.

This estimate is then turned over to the cost department for putting in cost of material, burden per operation, cost of scrap and repairs. The estimate is then ready for the sales department.

When the sale is made the same estimate which is now considered a "standard cost sheet" is turned over to the cost department to be used as a comparison with the work actually performed by the operator. Any variation from the standard cost sheet when checked with actual performance is a profit or loss on the job.

To assist the manufacturing department, a copy of the operations to be done on the part with the standard hourly production quantities and the scrap and repairs percentage allowance is given the foremen at the time the order goes into the shop. With these data he can check the operator each hour to see whether or not he is meeting the standard.

A copy of the standard sheet, showing the operations to be done on the part, the quantity to be produced per hour and the scrap and repairs is given the superintendent and foremen at the time the work goes into the shop.

With this information on hand the superintendent and foremen know exactly the standard manufacturing basis on which the article was merchandised. Note the difference between this method and the old one of keeping information from the superintendent and foremen. Our policy is to give the men as much information as possible to secure their cooperation in lowering costs. This information is always given where a variance from the standard occurs and is always quoted in dollars and cents instead of percentage figures, as we believe better efficiency may be obtained by quoting dollars and cents at all times.

Up to this point the control of production costs is comparatively simple, but it is not so easy with the items of scrap and repairs. In the standard cost sheet a percentage has been allowed for these items and it is of vital importance to produce the tube within these percentage allowances.

To control these factors an inspector

visits the job at regular intervals, scrap from each operation is recorded and quantities thrown out for repairs are checked against the total production. These data are then given to the factory superintendent. If standards are not being adhered to he can remedy the situation then and there; thus keeping control of these two vital cost problems.

All data concerning scrap, labor, repairs and hourly production are tabulated by the cost department the day following the production, accumulated into totals and we have a daily profit and loss sheet for all work performed in the factory. Daily accumulated totals are carried through to the end of the month to be used by the bookkeeping department in determining the monthly profit and loss. Thus, when the last day's operations have been added we have a profit and loss account of all manufacturing operation costs.

Sales invoices are costed from the standard cost sheets which take out of work in process standard amounts of labor, material, burden, scrap and repairs. Normal variances on each of these items are set up in the general ledger and the net result gives us the profit and loss for the month.



Thank you, Mr. Miller, for presenting this picture of an exceptionally useful cost system. When an executive can obtain, each day, a complete profit and loss statement for all work performed in the factory on the day preceding, he is in an excellent strategic position from the standpoint of control, regardless of conditions.

A few moments ago we heard Mr. Drillette tell how his company is using the group bonus plan to help hold his organization together during dull times. There are other avenues of approach to the same end, of course. Among them are the completion of maintenance work and the balancing of inventories. Both of these activities can be profitably pursued when production is slack. Then when the rush comes again, as it will, the plant is not handicapped by poor condition.

We have asked Mr. John T. Chidsey, president of Veeder-Root, Inc., of Hartford, Conn., to say a few words on this subject.

**Mr. Chidsey:** I believe that all progressive concerns should, especially during a depression such as that from which we are just emerging, give particular consideration to needed maintenance and repair work.

We all know that no company can long continue successfully in business without maintaining its plant and equipment at the highest efficiency. But in busy times, as during 1929, all of us are apt to keep our men directly employed on production wherever possible.

The stress of filling rush orders and generally maintaining intensive production requirements is responsible for this tendency.

Maintenance may be neglected for the time being, but the wise executive takes the next suitable opportunity to make good these deficiencies.

Catching up on maintenance during slack times provides work which may be of much assistance in retaining employees





whom it might otherwise be necessary to lay off.

Balancing of inventories also provides a profitable way to keep men busy. For while we are all careful about increasing inventory yet, frequently, weak spots in the parts' inventory develop. Checking over these various items of inventory parts frequently results in finding some work quite advisable to do in dull times, even though it may produce a slight temporary increase in the total inventory value.



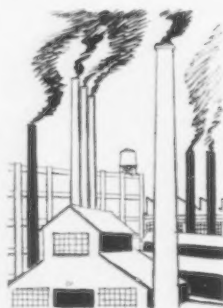
Many of you gentlemen who are present at this conference operate gray iron foundries, either in connection with other plant activities, or as independent merchandising units. You are aware that a good deal of money can easily leak out of the average foundry, either in good times or poor ones, unless the leaks are stopped up with a tight cost control system. One of the most common causes of profit leakage is the costing of castings on the poundage basis, which is very misleading.

The Liberty Foundry, Inc., of Wauwatosa, Wis., is one of the progressive foundries which avoid this leakage by obtaining actual costs on each pattern and for each customer. They manufacture castings which average less than one pound in weight, use many hundreds of patterns each month, yet obtain detailed costs on a ten thousand ton annual production with but two clerks. Mr. William J. Grede, president of this company, will now tell us how this is done.

**Mr. Grede:** To many foundrymen the developing of costs means merely the preparation of figures which indicate the cost of doing business for a certain period. If sales exceeded cost, they have made a profit, but many of them do not realize the source of the profit, that is, which customer, or which pattern, or which class of work has yielded a profit and which has resulted in a loss. When the figures at the end of a period indicate a loss, they are quite at sea as to where the loss occurred. Our costs are kept in such a manner as to enable us to tell not only the profit or loss at the end of a period on the entire plant operation, but on each individual customer and on each individual pattern. This sounds like a very expensive program, but, in fact, it is not. With an annual production of 10,000 tons and over 100 active accounts, involving, each month, many hundreds of different patterns, we do the work with only two clerks.

We obtain our costs both for the operation of the entire plant and on the individual accounts of the customers, the former give us the basis for the calculation for the overhead percentage charges. The detailed costs are utilized in the analysis of our casting costs for the purpose of improving our future business by increasing the price of unprofitable jobs, or to show us where jobs can be profitably made at a lower price rather than to lose the business. Of course the historical data, obtainable on orders which repeat, can be used as a basis for quotations on new orders.

The foregoing, of course, is especially applicable to foundries like ours that are involved in the merchandising of castings. To manufacturing foundries who make their own work, this is not quite so applicable,



except that if such foundries would analyze the cost of the individual items that they produce they would soon find that when estimating their cost on a flat price basis many of the items are being manufactured at a loss and could be more profitably dropped from the line, or possibly redesigned.

The benefit to all foundries, both merchandising and manufacturing, of a satisfactory cost program is largely in the help that the figures and information will render in the reduction of expenses. The saving in this direction alone will more than pay for the clerical time required to keep it up. Any number of specific instances could be pointed out in our own organization, and in addition to that we have two plants which enable us to compare costs and expenses.

Many of you may be interested in the "cost group" plan. With the help of the Gray Iron Institute, 15 or 20 gray iron foundries are combined into a group for the purpose of comparing costs. At the outset each member of the group thinks that his work is so different from anyone else's that a comparison of his costs with others would be impractical. This is not the case, however. A visit to the Milwaukee cost group which includes foundries like ours, manufacturing castings with an average weight of less than one pound and other foundries which cast pieces weighing as high as 75 or 80 tons, will show that the comparison of our costs has been very helpful to all. Such groups are now being formed all over the country and if any foundryman is interested in this subject a communication to the office of the Gray Iron Institute at Cleveland will bring information as to the nearest cost group in his district.



I am sure that all of us have profited by attending this Round Table and participating in this interchange of executive experience. It is a good thing for us to know what the other fellow is doing and how he is meeting present-day conditions. On behalf of the large family of IRON AGE readers who have been present in spirit at this conference we extend a vote of thanks to you gentlemen who have taken the active part. We shall now adjourn, to meet again, shortly, for a discussion of another timely subject.

### Pattern Drafting for Sheet-Metal Shops

A pamphlet of 32 pages, giving the fundamentals of pattern drafting for sheet-metal shops, has been published by the Sheet-Metal Shop Service Bureau of the American Rolling Mill Co., Middletown, Ohio. Copies are available on application to that company. This pamphlet is divided into 12 lessons, each illustrated, to show how the work is carried out. It takes up pipe intersections, inside and outside miters and various joints of sheet metal of more or less complicated form.

It is taken from a series of articles on pattern drafting, published in "Ingot Iron Shop News," and prepared by Martin J. Raubenstraw of the Carnegie Institute of Technology, Pittsburgh. It is based, of course, upon the principles of projective geometry, giving practical application to those principles in the field of sheet metal.



## State and City Cooperate in Trade Education of Employees

**W**HETHER workmen should understand the nature of their work or be content in merely going through motions is a question that has commanded the attention of the Perkins Machine & Gear Co., West Springfield, Mass. It is of especial interest because the State of Massachusetts and the city of Springfield, as well as the company, took a lively and aggressive action in its solution. The achievement itself is the direct outgrowth of the belief of the company's factory manager, S. F. Cushman, Jr., that the more a man knows about the work he does the happier he is, and hence the better workman he becomes.

Consequently, when, at a meeting of executives of the company, an offhand statement was made by

one of the officials that he would lay a wager there was not one man in ten in the plant who knew what a base circle was, Cushman accepted this as a challenge. He investigated and found the official to be correct. He felt that this condition was not right and set out to remedy it.

It was one thing to cut an involute gear tooth to specified dimensions with no knowledge of the nature of gearing, Mr. Cushman reasoned, but it would be an entirely different thing to do the same job when one understood the nature of involutes, base circles, diametral pitch, etc. He was satisfied that, if the men in his plant knew more about the fundamentals of the work they were engaged in daily, they would be an entirely different class of workmen.

▲   ▲   ▲

**W**HEN company, city and State join hands in fitting men better to perform their tasks the benefits accrue to all four. How this was done in a gear-making plant is set forth in this article. Those men who volunteered for the course—68 of them—received adequate instruction, on their own time. Better production, less waste, higher morale—these are among the company's dividends. The men became more highly competent operators. City and State gained through this fact and from aiding in making more contented citizens, with added zest for their work.

▼   ▼   ▼



With its new, modern, daylight plant on five acres of land, and 75,000 sq. ft. of manufacturing space all on one floor, with its gear manufacturing equipment consisting of the latest types, including many special machines of its own design and manufacture, the company had provided all the material conveniences and facilities for the production of gears of the highest quality.

In the matter of personnel, however, it did have a problem, for while the men were all loyal and industrious, and supplied with a fair knowledge of machinery and its operation, they were naturally, with a few exceptions, deficient in a specialized knowledge of gearing. To make the personnel as ideal as the plant and the equipment, all that was needed was this specialized knowledge. Of course, it must be understood that the men on the whole are a thoroughly capable aggregation of workmen, with as high an intelligence rank as is ordinarily found in a shop, and possessing a high degree of skill in their chosen work.

#### Civic and State Cooperation Secured

It will be of interest to observe how a satisfactory training course in gearing, given in the shop, was arranged through the joint cooperation of the State, the City of Springfield and the company. The Springfield Trade School was giving a course in gearing, in its regular schedule, to those going to the school. Mr. Cushman felt that it would be equally proper and appropriate for the school to give this course, or a similar course modified to fit the need of the registrants, in a plant where gears are made.

Certainly, the men in the gear plant were entitled to take the course in the school if they could arrange to attend the classes. It became then a matter of arranging to take the course to the men. George A. Burrige, head of the school, proved to be very responsive to the opportunity of taking education to his charges, where his charges were unable to come to the usual place provided for such instruction. Then, too, Mr. Burrige felt that the opportunity provided an unusual experiment in trade school educational methods.

Accordingly, it was arranged for an eight-week course of two lessons a week, to be given by the Springfield Trade School at the expense of the cities in which the men resided and of the State of Massachusetts. The State stands half the expense of the instruction and the cities divide the remainder in proportion to the number of their representatives in the course. The lessons were given right in the shop, in a section especially equipped as a classroom, with the necessary blackboard. The course was prepared and given by Joseph B. Elvin, instructor at the

Springfield Trade School. The series of lessons was carefully prepared in mimeograph form, and the sheets were bound in an appropriate folder. Each one registering in the course received a copy. The company's share of the expense consisted of the purchase of a blackboard, chairs and materials needed,

together with the typing, mimeographing and binding of the notes. The class met at the close of the day's work, 5 p. m.

Beginning about Feb. 1, this course was completed about the second week in April. It was given on the men's own time. Sixty-eight men enrolled, including the superintendent, foremen, inspectors, draftsmen, tool makers, set-up men, operators, young and old. Men from every department of the plant were taking the course.

Each one registering was required to deposit \$2, with the understanding that the money would be refunded to those who finished the course and that, in case the course got over the heads of any of the registrants, they would be excused and their deposits returned. There was no other expense to the men themselves. Of the 68 who registered, 60 completed the course. Of the few who dropped out before completion, some lost interest, some were laid off, and a few found the course too difficult to follow.

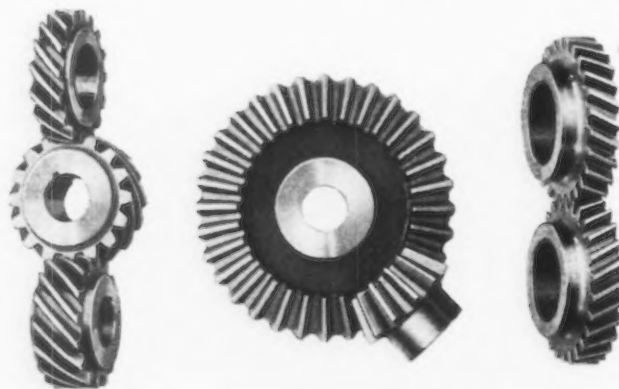
#### Beginning with First Principles

**S**TARTING with a comparison of belt and friction drives, the course led naturally into the addition of teeth to the pitch circle, in the formation of the spur gear, the naming of the various parts of the teeth, definitions, and the application of formulas. The involute was defined and methods for drawing the curve and the teeth developed.

Particular attention was paid to the base circle in its relation to the line of action and the pitch circle. A discussion of the rack followed, including means for determining the angle of side of tooth, the pressure angle, and the method of generating. Gear ratios were explained, as were methods for measuring the teeth both by the thickness micrometer and the pin-measurement method.

These were followed by a discussion of the short, thick, Fellows stub tooth with its 20-deg. pressure angle. The increase in rolling action, with a corresponding decrease in sliding or rubbing between the teeth, was very nicely explained as the reason for the advent of this form of tooth, and hence its adoption for machine-tool change gears and its general use for automobile gearing.

The fractional diametral pitch, of the form  $\frac{a}{b}$ , characteristic of stub gears, was also defined, where  $a$  designates the pitch from which the pitch diameter and number of teeth are figured and  $b$  the pitch from



**W**ORK made by employees of the Perkins company after receiving instruction in its characteristics. It included a train of spur gears and a worm and wheel, beveled gears, both ordinary and spiral, hardened and ground worms, etc.



which the addendum, dedendum and clearance are figured. Loads on gear teeth were then taken up, with a lucid explanation of the nature of the forces involved. These matters were followed by the method for determining the strength of gear teeth by the Lewis formula.

#### Action of Worm Gearing Considered

Following the discussion of spur gears, the worm and worm wheel were treated in a thoroughly understandable manner, with definitions. The thread form of both the Brown & Sharpe tooth and the  $14\frac{1}{2}$ -deg. involute tooth were given, as were formulas and the relation between the worm and gear. Cutting of worms in the lathe and by generating were explained, as was the hobbing of gears. These were followed by a discussion of the Perkins system of measuring worms, a study of the axial and normal sections and of the normal pressure angle, and the solution of problems from shop blueprints.

The last portion of the course was devoted to bevel gears, both ordinary and spiral. This study was based on the conception of pitch cones, followed by the addition of teeth to them. Then came the figuring of the essential parts by means of tables and by the trigonometric method. Trigonometric formulas were introduced at this point. The tooth forms and methods of cutting were next discussed, embracing a comprehensive study covering the selection of cutters, the back cone, milling, planing, generating, and single-cutting.

Under spiral bevel gears, the shaft angles were taken up, as were the special cases of the straight-tooth and curved-tooth crown gear. Following this came a treatment of the

tooth curve, involving the explanation of the logarithmic spiral, the tooth arc, and spiral angle. The course concluded with a discussion of the cutting of spiral bevels and an explanation of the Gleason tooth system.

#### Men Freed from Restraint

A SPECIAL feature of the course worthy of note from its educational merits was that no home work was assigned and that no examinations were given. The reason back of this procedure was the fear that, if the men thought they were to be checked up on the work, they might be reluctant to take the course. They were, however, encouraged to ask questions, and problems were assigned which they were encouraged to work out at home. This principle proved to be quite sound, as much progress was made.

Mention should also be made of a secondary course given in connection with the main course. When the main course got under way, it was noticed that some of the men began to flounder when problems involving the solution of triangles came up. This led to the organization of a second course, given also on the men's time, but during a portion of the noon lunch hour. It met three times a week. In this course, given by one of the company's engineers without charge to the men, the solution of simple triangles, by means of tables, as given in Kent's Pocket Book, was fully explained. Thirty-five took the course. By a combination of the two courses, it became practical for those registering in the main course to carry through to a successful end.

The effects of the course are plainly noticeable in that more intelligence is brought to bear on the work, with a large reduction in scrap, prints are more

**W**ITH almost two acres on one floor the Perkins plant is laid out for quantity as well as quality production. The cutting department is at right and tool room at left.



# Accurate Finish for Match

ANY pattern which is to have a long production run deserves the highest possible accuracy in its construction and finish. The pattern shop motto, "No casting can be better than the pattern from which it is made," should be kept in mind by everyone who has any interest in the product—from the designer who first lays out the parts to the production superintendent who is responsible for the machining and assembling. The purpose of this article is to describe the method employed in making a match plate for an irregular shaped part.

Fig. 1 shows the male and female parts of a special pipe fitting which is to be cast in bronze or malleable. The peculiar shape makes it apparent that a multiple pattern must have all the individual pieces exactly alike, within very close limits. The slight shifting of a core, such as would be caused by a variation in the length of core prints, would move the core out of center and render the casting worthless.

In Fig. 2 the two individual patterns with their core prints are shown, while Fig. 3 shows the completed match plate with the patterns mounted and gated ready for molding. The individual patterns are of aluminum, while the plate is of either aluminum or steel. The gate, consisting of the central runner with a branch leading to each pattern, is either of aluminum or lead.

Match plates of this type are often made by molding the desired number of parts in a snap flask, then when the patterns are drawn, inserting a spacer around the edge of the flask between the cope and drag so that the plate will be cast at the same time. There are several objections to this method, especially where

extreme accuracy is required. First, there must be as many master patterns as the number of individual patterns that are to be mounted upon the plate. Second, should one of the pieces be defective because of a blow hole, pouring short, gas explosion, or any one of a number of possible troubles, it would be almost if not quite impossible to repair the defect.

Another objection is that the final finish must be given after the patterns and plate are all cast together, which makes a rather difficult finishing operation. There is always the possibility of unequal shrinkage in the different pieces which cannot be adjusted after the plate is cast. But probably the greatest objection is the possibility of a looseness in the flask pins which will permit the two parts of the mold to shift, and thereby cause an offset in the entire plate.

To avoid all these difficulties in the match plate illustrated, the master patterns are made so that certain parts of the working patterns can be accurately machined, leaving only the irregular curves to be worked out to template by hand. Reference to Fig. 4 shows how this is accomplished. As indicated by the dotted lines in the figure which shows the finished size of the pattern, the core prints are left considerably over the finished length, in order to allow room for a machine screw, and, beyond this, a hollow center upon which it can be turned. Opposite each core print, and beyond the lines of the finished pattern, is cast a lug, also long enough for a machine screw and a hollow center. It will be understood that the patterns are made in halves, split longitudinally.

The first operation is to grind the flat mating surfaces so that the two halves will come together without any opening around the periphery of the joint. This is done on a disk grinder or a belt sander. The lines upon which the turning centers are to be located are now scribed at the ends of the core prints and the extension lugs by making use of the sheet steel template shown in Fig. 5. The lines are marked on one-half of each mating pair so that the exact center is visible when the two halves are clamped together.

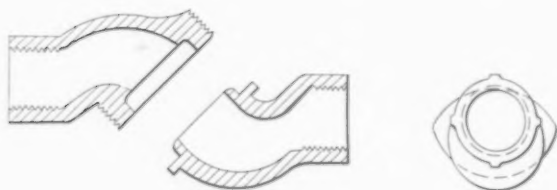


FIG. 1.—Male and female parts of a special pipe fitting. (above)

FIG. 2.—Two individual patterns with their core prints. (right)



# Plate Patterns

By PAUL H. WHITE

Mechanical Engineer, St. Louis

**E**VERY foundryman must keep in mind the fact that a casting can be no better than the pattern. The highest possible accuracy in its finish and construction is essential. The author describes how these principles were adhered to in making a match plate for a part which was unusually irregular in shape.

The halves are now clamped together, and the dowel holes, A, are drilled and fitted. The six screw holes are next drilled and tapped, and the two halves clamped together with the screws. The screw holes in the core prints are counterbored to a sufficient depth to sink the screw heads below the finished diameter of the prints.

Centers are now drilled on the lines previously marked, and the pattern is mounted between lathe centers. The small core print is first turned to the

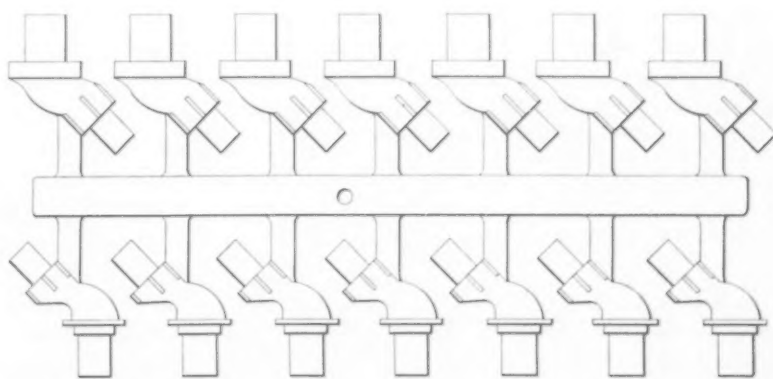
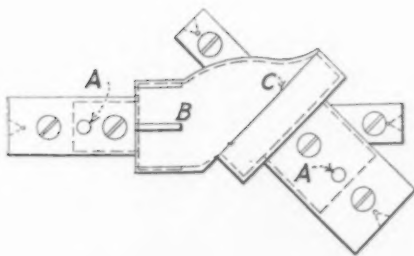
required diameter and length, then the outside of the four gripping lugs are turned down. The spaces between these lugs are finished by mounting a shaving tool in the tool post and moving the carriage longitudinally by hand. This permits an accurate finish up to the point B, and leaves this part of the pattern concentric. The surplus length of core print has now served its purpose and is ready to be cut off, as is also the case with the lug opposite.

The pattern is now mounted upon the other pair of centers and finished up to the point C. The only part left to be finished is the body from B to C, which must be done by hand on account of its irregular shape.

To mount the finished patterns upon the plate is the next process. The screws are removed and the two halves are separated, after which the parts which are to be molded in the cope are laid out upon the plate, and the two screw and two dowel holes are scribed through each piece on to the plate. The half patterns are now removed and the scribed holes are drilled through the plate. These holes are all drilled with ample clearance so that neither the screws nor the dowel pins will bind against the sides of the holes. The half patterns are now mated and secured to op-

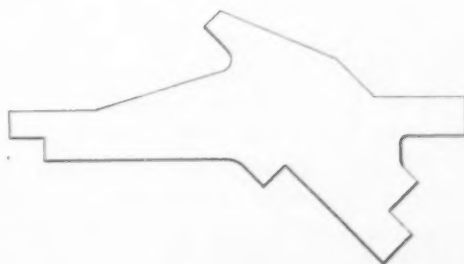
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**FIG. 3.**—Completed match plate with the patterns mounted and gated ready for molding. Patterns are aluminum and the plate is aluminum or steel



**FIG. 4.**—How certain parts of the working patterns can be accurately machined. (left)

**FIG. 5.**—Sheet steel templates showing lines on which the turning centers are to be located. (right)







# Too Much Haste Spoils

By A. H. DEUTE

General Manager,  
Billings & Spencer Co.

**T**HIS happened to be an affair in a tractor plant. Conditions made it advisable to employ a new general foreman in the assembling department. After proper search and investigation, the selection was made. The new man had been the assistant foreman in a larger factory. His background and experience made him appear to be the ideal man.

He came to the town in which his new factory was located. Bright and early on the appointed Monday morning he was on the job. He fairly bristled with efficiency and action.

It did not take him a day to find out that a thousand and one things were all wrong. He placed his fingers on waste and inefficiency in all directions.

He jotted down for the factory manager a dozen or more immediate moves which would make for immediate savings and for greater production.

Within a week, most of these moves had been made. He was a marvel of speed and promptness. "Do it now" was his slogan. And he practised what he preached.

But for some reason for which the new foreman could not account, results were not commensurate with his hopes and expectations. He felt that the men and women in the department were not working with him—that they were holding back.

Within three months he was gone from that factory. It was an argument as to whether he had resigned of his own volition or been asked to write it out.

Now, it was a hard thing for the men who knew him in his former connection to figure out wherein he had fallen down. But the rather crabby but shrewd old chief summed it up like this:

"It's an old story. A man comes into a new factory. He is new on the job. The help doesn't understand him. He doesn't understand his help. But most of all, he fails to understand the particular problems with which this plant is confronted.

"He has a group of set ideas—ideas which worked out very well where he was before, but which are probably as peculiar to that factory as some of ours are to this factory. Without giving himself time to study,

he realizes that the ideas employed in his old job are different—he feels they must be better—he goes right to work to put them into effect. As a matter of fact, many of those ideas might well have been adapted to our needs and put into effect, probably with variations. Then they would have been very helpful. But thrown right in cold, as it were, the result is chaos.

"One sees a great deal more of that than one should see. It seems to be a difficult characteristic of men who otherwise are very useful. In fact, this characteristic is one outstanding fault of the aggressive man. He wants to make good right away. He is impatient to demonstrate his worth. And so he bursts right in. It is often regrettable. Better for all concerned if somebody in position to do so holds the peppy newcomer to a more modest speed."

One of the best all-around machine shop foremen I ever knew missed by a mile or more his opportunity to make good on a big job. He found himself employed as production man in a busy shop. There was a mass of work going through this shop—a job shop by the way, with rarely two jobs alike—in every way a shop to test the merits of a capable man.

During the first week he came into verbal conflict with half a dozen foremen. They could not convince him that delay was warranted. Many an obstacle which to them seemed insurmountable appeared to be utterly simple to this man.

"Here," he would say, "let me tell you how to do that!" and away he was on his explanation. "There, start right in at this point and just keep on the way I have outlined."

And then he flitted off to another problem. To



# the New Foreman



him they seemed as plain as the proverbial nose on one's face. But for some reason, his explanations fell on seemingly barren ground. The shop foremen to whom he tried to explain his ideas listened quietly, but when he had turned away to the next job, they simply tapped their heads.

"Nuts!" one of them exclaimed one day. "He's just a bag of wind!"

Now, as a matter of fact, the new production man



was far from being a bag of wind. On the contrary, he was a brilliant mechanic with a quick and resourceful and inventive turn of mind.

But he shot right past the group of men with whom he worked and whose production he was expected to speed up and hold to schedule. He was so familiar with the methods in many cases that he took it for granted that the man to whom he gave a partial explanation would understand and go right on from the point where he left off. But what actually happened was that most of the foremen got the idea the new production man was entirely superficial. His broad outside experience and his native mental alertness took him beyond the reach of the men whose production efforts he was employed to aid and quicken. In short, he ran away from his job. He was unable to bring himself into tune with the men around him.

"It's just as bad for a man to run away from his group as to fall behind it," a factory manager remarked to me the other day. That, he explained, is why some very brilliant men fail to get proper results. They think too fast. They try too hard to make a showing too quickly. As a result, they irritate the men immediately under them. Their associates fail to understand them. They try too hard.

One of the best result-getters among factory men I know is a really easy-going and somewhat indolent man who is never in any particular hurry. Personally, I have never felt that he was particularly strong. At the same time, he manages to pull a big department along behind him. Studying him and analyzing him, one thing becomes plain—he is just one little jump ahead of his sub-foremen and his general force. He manages to keep just a little

**T**HERE are right and wrong ways to take hold of the new job. Many foremen choose the latter because of an unwise but natural desire to make a quick showing. It is safer to proceed slowly at first.

Mr. Deute has been in a position to observe a large number of instances in which foremen and other department heads have taken over new responsibilities. He has noted the general tendency to proceed too hurriedly, and he believes that the responsibility and the remedy for this lies in the hands of the management.

ahead of them, but still so near them in his ideas and his undertakings that they do not lose sight of him.

A general manager of a factory making a long list of automotive parts for a long string of customers told me recently of a man who turned out to be "the best man and the worst man" he had ever employed.

This general manager was running an eastern factory in which the jobs were mainly short runs. He had heard a great deal about a certain young "speed hound" who was making a great record in a plant near Detroit. Some of the production records which that western plant could show were nothing short of phenomenal. The young man in question was undoubtedly responsible.

The eastern manager was not going to be provincial. "If there is a man in the west who can give us what we need, we want him!" And so the western man was brought in.

He brought his entire bag of tricks. And they were worth while. But he dropped from a plant making runs of half a million pieces or more, to one which would look upon a half million pieces as at least a dozen orders. In other words, he had come from a long run shop into a short run shop. He brought methods with him which were highly successful under one type of production, but which were far from desirable in a short run shop.

But his principal trouble lay in feeling that he had to bring in a dozen and one new ideas during the

first week and month. He had the ideas. He put them into effect. But he was in the same position as a doctor who might have a whole volume full of good prescriptions which he began to feed into the patient before he had diagnosed the case. Here was a similar instance—undertaking to put new ideas to work without proper regard for the fitness of the shop to absorb and use them.

I was talking this subject over with a young foreman who was just about to start on a new job. He was determined to make good without delay. He was ambitious and energetic. He had had a great training under a very good man. The new job to which he was going was, he felt, only a stepping-stone to bigger jobs in the new organization. As the saying goes, "he was rarin' to go."

"Why not take it a little easy for the first month or two?" I suggested. "We've all a list of sad experiences resulting from trying to do the whole job during the first week. Why not study the case a little before you start to turn things loose?"

"Yes, that sounds fine," he agreed. "But more than likely the boss will have me in at the end of the first couple of weeks and want to know what I have done. And it will be healthier for me if I can report some headway. You know, they're paying me good money and they know there is a job to be done. I don't want to get a reputation for being a loafer. A bad first impression is hard to overcome."

Which is very true. But it is also true that if the first new idea introduced works out badly, that leaves a very poor impression indeed. Six months later, the house will forget whether the first real idea was put into effect two weeks or two months after starting. But it will remember whether it worked out satisfactorily or not.

That brings to mind the experience of a brand-new office manager who left a big organization where he had handled one highly specialized department in

a highly specialized manufacturing plant's office. That company had a splendid order system, worked out to do a great job of time and labor saving for a numerically small line.

In the new job, he found himself faced with what seemed a very antiquated system of preparing and routing orders for shipment. He visualized great and immediate savings. He saw at once where he could make savings the first week enough to offset his salary. He installed the necessary equipment and within ten days had his new system at work.

A month later, he ruefully went back to the old method, with all its evidently inferior qualities. However, the qualities which had seemed so inferior were no longer of such miserable appearance. On the contrary, they were very practical and useful, considering that the line contained over four thousand items and required an order system entirely different from the one which contained not more than a dozen numbers.

Which brings us to this: Whose fault is it when the newcomer runs away from his job? Who is to blame when the newcomer starts off on an orgy of revolutionary movements before he has even become acquainted with his surroundings?

It is a common fault—there is nothing strange in the disease. We have all run into it.

Is it not possible that instead of blaming the aggressive chap who comes into the new job, determined to "do or die," we should look to the management which permits him to start prescribing new cures before he has analyzed the patient and diagnosed the difficulty?

The head of a woolen mill in Oregon said to me one day: "When a man fails to make good, I often feel that the boss is a little more than one-half to blame."

And isn't it possible that that rule applies in the case of the foreman or the superintendent as well as in the case of the common laborer?



VISITORS at the National Metal Exposition in Chicago late last month were attracted by a new "Chrysler 77" which was on display. It was completely trimmed with what is known in the trade as rustless iron as produced by the Rustless Iron Corporation of America, Baltimore. The illustration does not bring out the full beauty of the car whose hood, radiator, mud guards, lamps, bumpers and wheels and other parts were made of this material, highly polished.



# Concentrate Hematites to Replace High-Grade Ores

By E. W. DAVIS

Mines Experiment Station, University of Minnesota, Minneapolis

**L**ARGE iron-ore producers on the Mesabi Range are able to maintain the silica in their shipping products at from 8 to 10 per cent by mixing ores of various grades, some assaying 4 per cent silica and some as high as 18 per cent. For each ton of 4 per cent silica ore mined, a ton of 14 per cent silica ore can be mined and mixed with it and the average grade maintained at 9 per cent.

This mixing operation has made possible the utilization of large quantities of ore too lean to be used alone, and herein lies the advantage of producers who operate a number of mines at the same time. As the grade of the ore from one property falls off, a little high-grade ore from another property can be mixed with it and the average maintained.

This mixing operation, however, can continue only so long as there is high-grade ore available for mixing with the high-silica ores. While the tonnage of iron ore in the Mesabi Range is still enormous, the high-grade ore suitable for mixing with any quantity of low-grade ore is being rapidly depleted.

Obviously, if an 18 per cent silica ore can be reduced by concentration methods to 12 per cent silica, considerably more of it can be utilized with a given amount of high-grade ore. Operators on the Mesabi Range recognize this situation and are energetically endeavoring to reduce the silica in their concentration plants, because every unit of silica that can be removed by concentration is a conservation of their high-grade ores.

Processes to succeed in treatment of this low-grade material must take ore of difficult structures, moistures and analyses and from

them produce uniform low-silica high-iron concentrate suitable for blast furnace use, with a total plant-operating expense not much above \$1 a ton of concentrate. This would not be difficult if it were not for the fact that fine grinding undoubtedly will be required, and a considerable amount of fine concentrate will be produced that must be sintered. This sintering cost alone will amount to about \$1 per ton of sinter. Therefore it is apparent that a considerable proportion of the concentrate produced must be sufficiently coarse to eliminate the necessity for sintering this portion of the ore.

Seven generalizations on the beneficiation of low-grade Mesabi ores are presented, with the understanding that the statements are subject to modification through new developments in the field of ore dressing and changes in the price of iron ore:

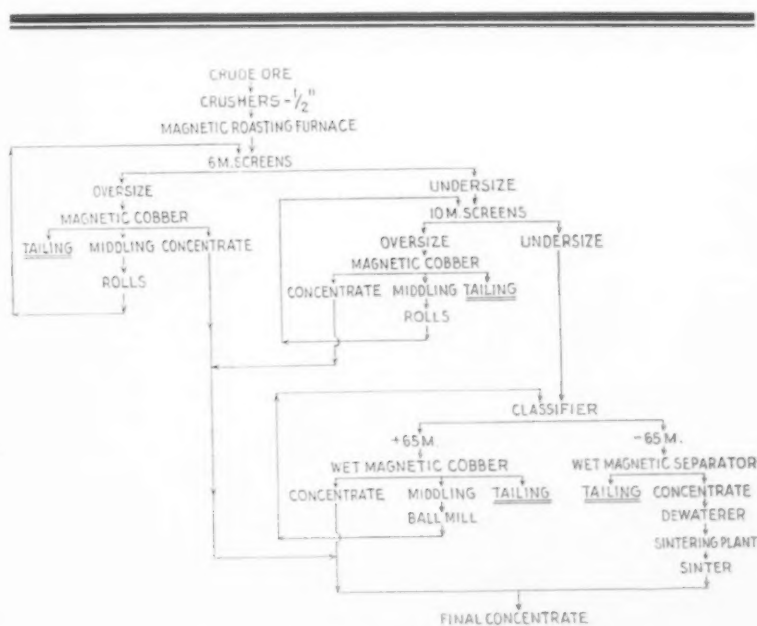
1. The concentrate produced should contain 9 per cent or less silica and 60 per cent or more iron.
2. Recovery of iron should be above 85 per cent.
3. At least one-half of the concentrate should require no sintering.
4. Radical changes in structure and analyses of the ore should not seriously affect the grade of concentrate produced.

5. The plant should be at some central point, so that its ore supply will come from a number of mines with a long total operating life.

6. The plant should be capable of expansion in size to produce at least 1,000,000 tons of concentrate during a shipping season.

7. The total cost of treatment cannot greatly exceed \$1 a ton of ore shipped, with the present price of iron ore.

Magnetic concentration is receiving some consideration. By giving nearly any of the Mesabi lean



Magnetic roasting and concentration flow sheet

This is abstract of a paper presented at the Chicago meeting, American Institute of Mining and Metallurgical Engineers, September, 1930.

ores, including the taconites, a magnetic roast and then using magnetic concentrating equipment, a high-iron low-silica concentrate can be produced. The flow sheet can be arranged so that good concentrate is recovered and low tailing rejected after each crushing step. By this means, a minimum of fine concentrate is produced, which requires sintering. The general flow sheet shows this plan of treatment.

In this flow sheet the only new and untried equipment is the magnetic roasting furnace. Roasting of hematite to magnetite is a simple process. The ore should be heated to a dull red and then brought into a reducing atmosphere for a short time. The time required in the reducing atmosphere depends on the size and porosity of the particles and the intimacy of contact with the reducing gases.

If all of the heat in the stack gases and in the ore discharged from the furnace were conserved, only about 23 lb. of coal would be required for the reduction of one gross ton of ore. Calculations, checked to a certain degree by laboratory work on a reasonably large scale, indicate that about 160 lb. of coal or equivalent fuel will be required for roasting a ton of ore assaying about 40 per cent iron and 6 per cent moisture. Much work has been done on the magnetic roasting of hematites, but it remains for a plant of commercial size to demonstrate the actual cost of this operation.

#### Magnetic Roasting and Its Cost

It is possible to arrive at a fairly accurate cost for magnetic roasting of hematite. A cost estimated at 50c. a ton for large-scale operations contemplates

using pulverized coal for heating and a small amount of fuel oil for reduction. This cost includes all operating charges, repairs and depreciation and is possible of reduction to 40c. a ton, but this is probably the minimum.

Assuming a 40 per cent iron ore, a 63 per cent iron concentrate and a 95 per cent iron recovery, it will be necessary to roast  $1\frac{2}{3}$  tons of ore to produce 1 ton of concentrate. This means a roasting cost of about 88c. a ton of concentrate. Various tests of this nature have indicated that about two-thirds of the ore can be recovered as coarse concentrate and one-third as fines requiring sintering. At \$1 a ton for sintering, the sintering cost for  $\frac{1}{3}$  ton of concentrate is 33c., which, added to the roasting cost, gives a total of \$1.21 a ton of concentrate. The cost of crushing, screening, grinding, classifying and magnetic concentration will be about 30c. a ton of concentrate, which brings the total cost of treatment slightly over \$1.50 a ton of shipping product.

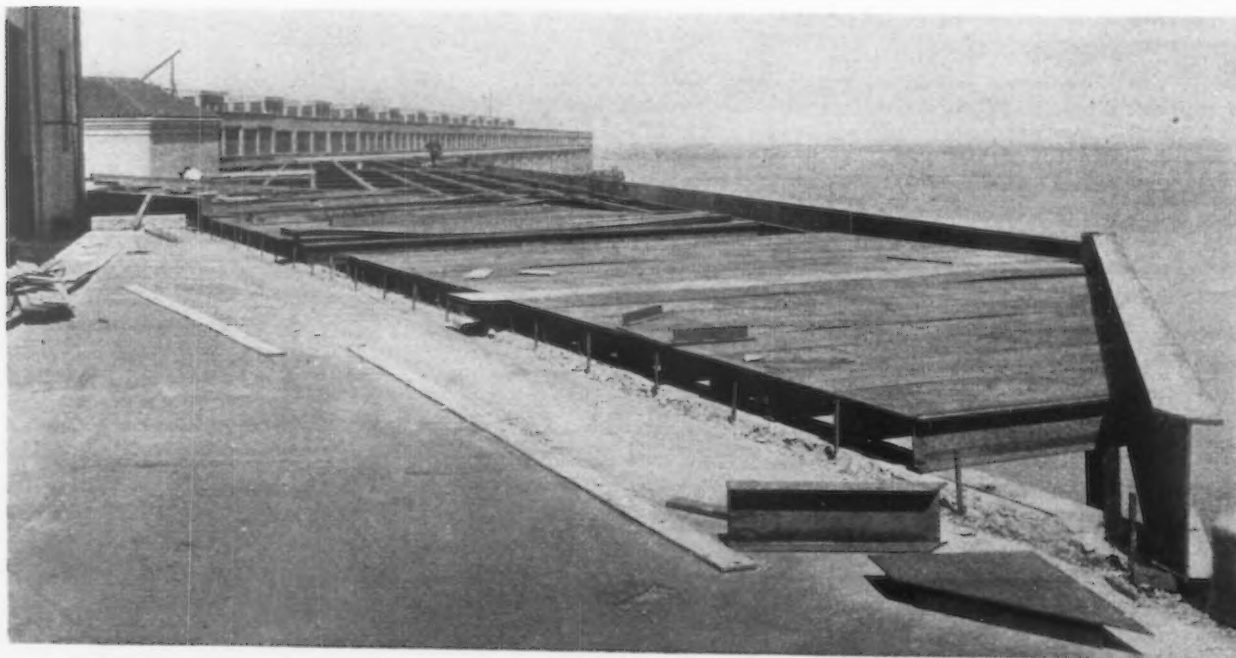
Summarizing, it is evident that the high-grade low-silica ores are being rapidly depleted, and conservation measures must soon receive careful consideration.

Concentration methods have not reduced the requirement for this ore, and probably cannot do so without a material increase in the price of iron ore. Foreign ores will tend to keep the price of iron ore from increasing but, until the price does increase, the high-grade ores must carry the burden of the shipments and, conversely, as long as the high-grade ores can carry the burden of the shipments, the price will not increase.

## ANOTHER APPLICATION OF THE BATTLEDECK FLOOR

About 2000 sq. ft. in this "Battledeck Floor" forms the loading platform for the new cold storage ter-

minal in process of construction for the San Francisco Harbor Board.





# X-Ray Control in Cold Rolling Steel Sheets and Strip

Written for THE IRON AGE by the  
Republic Research Corporation

THE very simple methods used in investigations of the effects of cold rolling could not be justified unless it were for the extremely brilliant and patient work of a number of investigators, such as Polanyi, Wever and Glocker.

An attempt will here be made to illustrate the theoretical background for the present-day use of X-ray diffraction methods in investigations of cold-rolled products. As is well known, iron crystallizes in the cubic system. This means that the atoms are arranged in space to give the symmetry of a cube. The unit cube is the distance between two of the atoms representing the edge of the cube and in the case of iron this distance is  $2.8 \times \frac{1}{10} \times \frac{1}{1,000,000}$  of a millimeter. These cubes are grouped together in such positions that all the cubes have the same directions in parallel positions.

A group of this type is described as a crystal, or in metallurgy a grain, and naturally the greater the number in one of the groupings, the larger the crystal. The next crystal is different in that all the cubes have the same direction.

In the ideal state the crystals have random orientation, or to put it in another way, the directions of the groups of cubes or lattices are in every possible position. The material has no directional properties. On cold rolling the iron, or steel, slip occurs along certain of the crystal planes and, with a combination of

IT is possible to determine the ideal position of the crystals in a sheet of steel by means of the X-ray. This is of great aid in indicating the ability of the material to withstand such operations as deep drawing. How this principle is applied practically is revealed in this article.

slip and rotation, the crystals tend to move into position in which the cubes have the face diagonal in the direction of rolling and cube face in the plane of rolling. (See Fig. 4.)

It is not at all well understood why this particular arrangement should be taken up.

However, in no case do all crystals arrive exactly in that position and there is a large distribution of the orientation of the lattices about the "ideal" position. The metal has now directional properties and, though usually there is no extreme difference in the tensile properties between the longitudinal transverse direction, there are marked changes in the ability of the material to withstand such operations as deep drawing.

In Fig. 5, 5<sup>1</sup> is a photograph of a material which has random orientation: i. e., no "banding," while 5<sup>2</sup> shows a material which has been lightly cold worked. The difference in the semicircles is plainly visible. In the same illustration, 5<sup>3</sup> is a material which was slightly cold worked and is an intermediate stage. The maxima on the circles are not so strong as they are in 5<sup>2</sup>.

Fig. 6 gives a series of photographs of a piece of plain carbon (0.10 per cent C) material which was rolled down from 0.083 in. to 0.013 in. in 12 passes. The figures placed under the photographs give the ultimate strengths and the yield points for the material at the various passes.

It will be seen that there are but slight differences in the last photographs. The fibered state of cold-rolled strip is very undesirable.

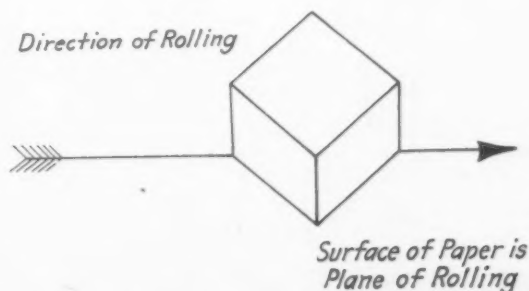
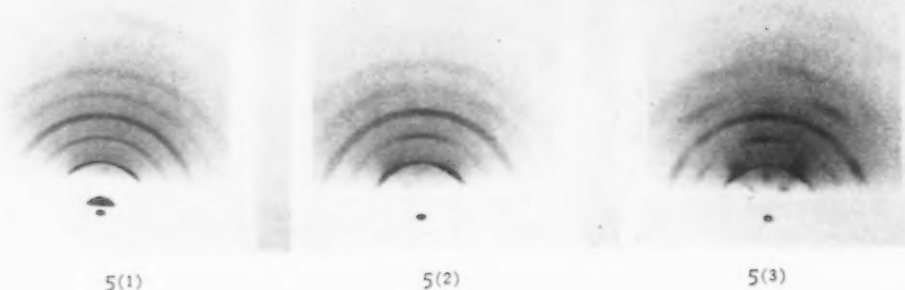


FIG. 4—Crystals tend to move into the position in which the cubes have the face diagonal in the direction of rolling and cube face in the plane of rolling

This is the concluding portion of an article "Physics as an Aid to Metallurgy," published in THE IRON AGE, Oct. 16, page 1066.

FIG. 5—5<sup>1</sup>, X-ray photograph of a material having random orientation or no "banding"; 5<sup>3</sup>, material lightly cold worked, while 5<sup>2</sup> one slightly cold worked and in intermediate stage between the other two



able where the material must be stamped or formed. In such operations as deep drawing, the primary requisite is softness for, in stamping involving a great degree of cold work the metal must flow easily. It has also been found that where physical tests have established that the metal has attained a sufficient degree of softness by annealing or normalizing, the material is not of necessity in a state suitable for cold work. Fig. 7 (7<sup>1</sup>, 7<sup>2</sup> and 7<sup>3</sup>) illustrates a case of this type.

Some Enduro or KA<sub>2</sub> (18 per cent Cr, 8 per cent Ni) was tested by the usual methods—tensile strength, yield point, Erichsen test, Rockwell hardness, and so on—and passed as being satisfactory. Another batch of the same type of material had similar properties and both lots were shipped to the customer. The second coil formed admirably into a complicated shape, while the first always cracked. The first coil was returned to the laboratory and retested. The same physical properties as before were found. The material was then X-rayed and a piece of the second coil was also examined. (7<sup>1</sup> in Fig. 7); in Fig. 7, 7<sup>2</sup> shows the diffraction pattern for the first coil, the semicircles still have maxima and minima while the lines for the second coil are uniform and continuous.

A third coil (7<sup>3</sup> in Fig. 7) with suitable physical properties was X-rayed before shipment and gave a

pattern similar to the second coil. This third coil stood the operation of deep drawing without revealing any cracks whatsoever. Coil 1, as indicated by the X-ray pattern, was still "banded" or fibered, while in the other two coils the crystals were oriented at random.

It may be well argued that the physical tests employed were not suited to the particular purpose. That may be true, but all the accepted tests were tried; to devise further tests of an arbitrary nature is to complicate the situation without obtaining any really sound knowledge.

The X-ray gives direct information as to the arrangement of the crystals while giving a method of testing for rejection. It is not necessary to use the X-ray as a means of testing; it is more satisfactorily used in the investigations of the treatments required to produce crystals in random orientation, and careful control of the process will prevent the shipment of strip that will not deep draw.

An illustration of the susceptibility of low-carbon steel to heating is given in Fig. 8. The strip was rolled down from 0.083 in. to 0.020 in. and the degree of preferred orientation is shown qualitatively by Fig. 6. Strips of this material were annealed at temperatures of 900 to 1800 deg. Fahr.; the second at 1000 deg. Fahr. shows an increase in grain size. This is determined by the breaking up of the uniform lines

into a series of spots. This is more aggravated at 1100 and 1200 deg. Preferred orientation is still present. At 1300 deg. Fahr. the preferential orientation has disappeared; the lines, though broken up, possess no maxima.

While this was a laboratory experiment relatively, the same conditions hold in practice and

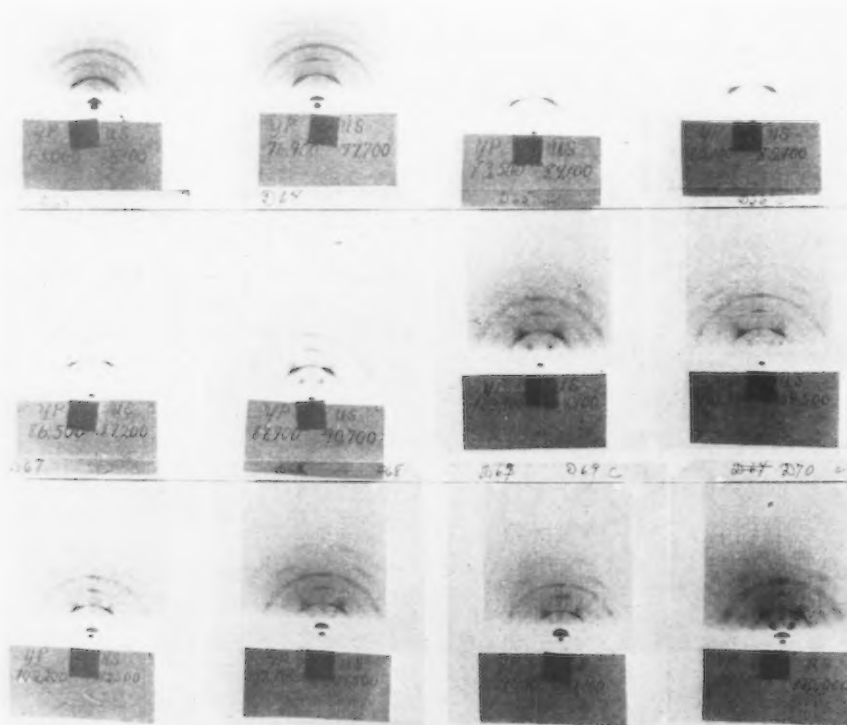


FIG. 6—A series of X-ray photographs of a plain carbon (0.10%) steel rolled down from 0.083 in. to 0.013 in. in 12 passes. Physical tests are given at the various passes



FIG. 7—X-ray photographs of material not in a state suitable for cold work

the careful observance of temperature and time factors is essential.

With the ever-increasing demands for the control of processes in industry, metallurgy will draw to a greater extent on physics, not only for its inspiration in investigations, but for the construction and design of control apparatus. The problems of the atomic and electronic arrangements of the metallic state are far from being solved, and the physicist, spared by the difficulties of the problem, is pressing his investigations in that direction. Metallurgy is beginning to appreciate the limitations of purely arbitrary and empirical methods and is beginning to take an active interest in modern physics. How far this will go is a matter for conjecture, but the hope that a great many of the unexplained phenomena of metallurgy may have their answer in atomic physics is alluring.

### Rational Plant Construction

DISCUSSING methods of cleaning coal for use in steel plants, Kenelm C. Appleyard, managing director, Birtley Iron Co., Birtley, England, and Edward O'Toole, general superintendent, United States Coal and Coke Co., Gary, Ind., in a paper read Oct. 24 before the American Iron and Steel Institute, pointed out a great difference in practice regarding plant design, between the United States and Europe. The following paragraphs, taken from their paper, have a bearing in connection with other types of plants as well.

Standard plant construction in Europe is steel framework with concrete floors and brick paneling. With properly balanced machinery these buildings are free from vibration, fireproof, and, as a rule, carry a low insurance rate. Twenty years is taken as their life

for accounting purposes, although, naturally, companies vary in their practice on this matter.

In regard to dust, the 1930 plant in Europe is sufficiently free from dust to be visited in a light suit without even a dust coat, and the dust withdrawn from the coal is removed from the air and concentrated without discharge of anything but clean air to atmosphere.

America is not so advanced in these respects, and the use of timber construction, without adequately planned dust-removal systems, is to be deplored. It is undoubtedly unhealthy for workers and the danger of fire is greater than when the more permanent type of construction is used. The latter point is demonstrated clearly by American insurance rates, of which the following are examples:

System of Construction	Rates
All-wood construction .....	\$1.40 per \$100
Steel construction, wood floors.....	0.37 per 100
Steel construction, steel or concrete floors...	0.28 per 100

It may be said that, in general, coal passing through a dry cleaning plant should be in a closed system, which is under suction from an exhausting fan. In European plants the coal is never exposed to the atmosphere from the time it enters until the time it is loaded out into railroad cars. The result is cleanliness and safety.

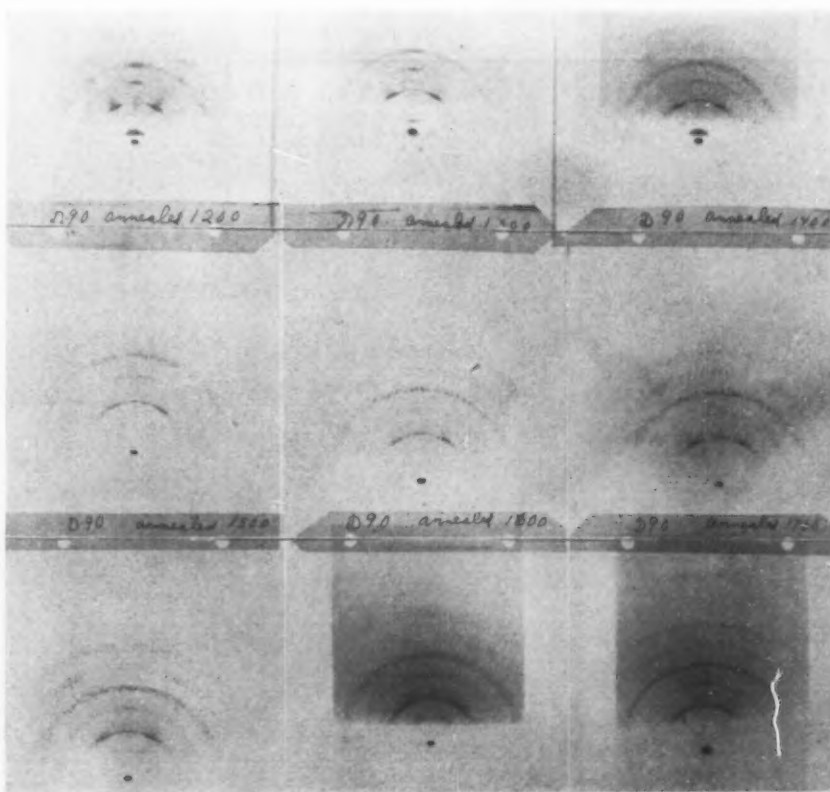


FIG. 8—X-ray photographs show the susceptibility of low-carbon steel to heating. Temperatures at which the strips were annealed ranged from 900 to 1800 deg. F.



# Spinning Gruss Air Spring Dome Heads on Steel Tubing

A DOME head is made on large sections of steel tubing by expanding and spinning the metal while hot, in the plant of the Cleveland Pneumatic Tool Co., Cleveland, which developed the methods and equipment used in this interesting metal-forming operation.

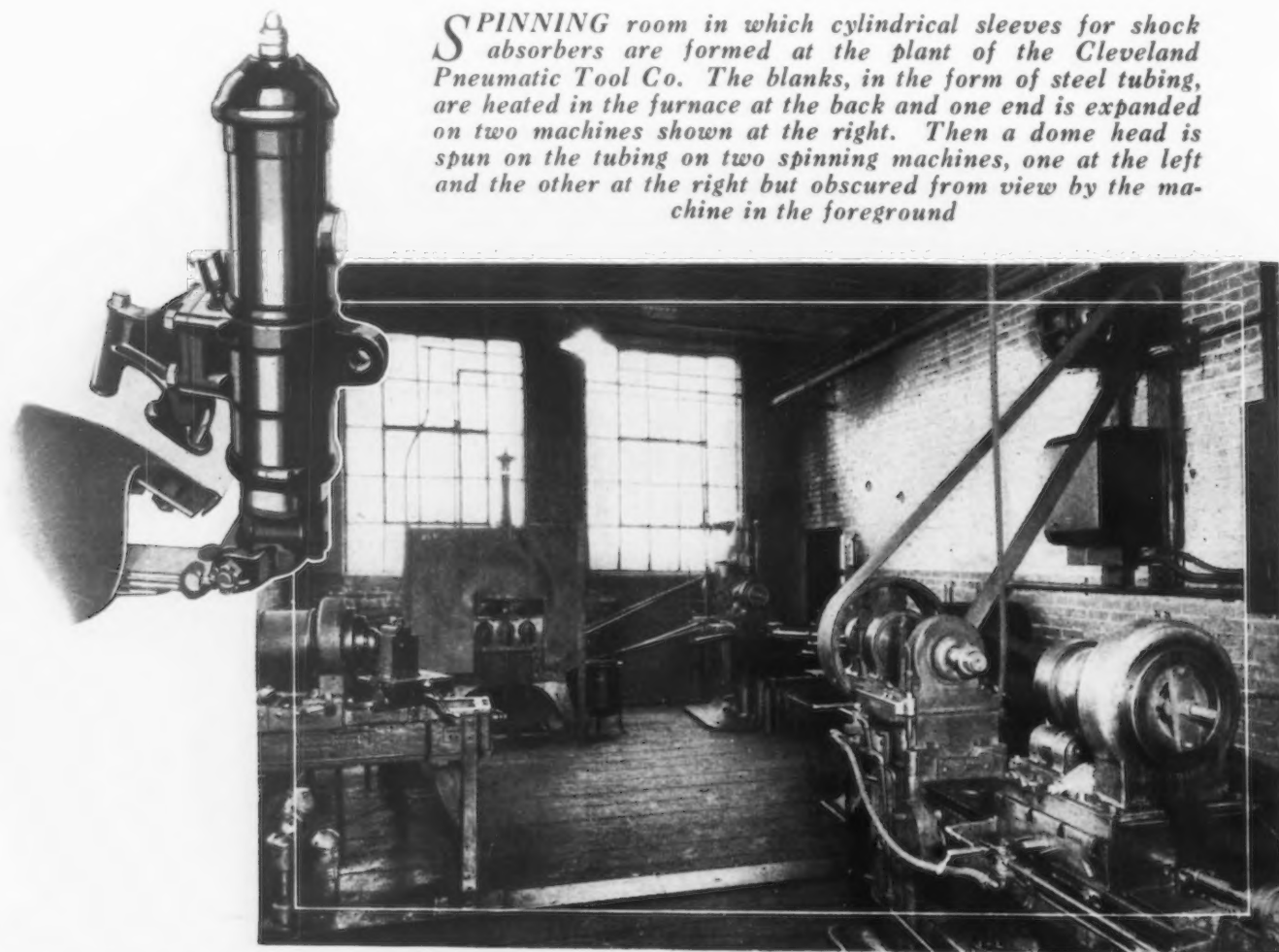
The tube is made into a cylindrical sleeve which is a sliding inner member in the Gruss air spring used on motor buses and trucks. This shock absorber is a telescoping cylinder mounted between the steel springs and the frame of the vehicle, its function being to add to the resiliency afforded by the springs. The absorber includes a housing attached to the frame, and in which a piston and the sliding sleeve move up and down. The dome, which is at the upper end of the sleeve, and is of slightly larger diameter

than the sleeve itself, seats on the top of the housing.

The piston operates against air pressure pumped in through a valve at the top of the dome. A blow delivered to the wheel of the truck or bus is transmitted to the steel spring, from which it passes to the piston and sliding sleeve, causing them to move upward and build up the air pressure sufficiently to absorb the blow. The small amount of recoil that develops is checked by the downward stroke of the piston.

When the air springs were first manufactured the sleeve was made of three pieces brazed together. To reduce the production cost and increase the strength of the sleeve the method of making it from one piece of tubing by expanding and spinning the metal to the required form was worked out.

*SPINNING room in which cylindrical sleeves for shock absorbers are formed at the plant of the Cleveland Pneumatic Tool Co. The blanks, in the form of steel tubing, are heated in the furnace at the back and one end is expanded on two machines shown at the right. Then a dome head is spun on the tubing on two spinning machines, one at the left and the other at the right but obscured from view by the machine in the foreground*



For air springs in the size more commonly used the sleeve is made of seamless steel tubing  $4\frac{1}{2}$  in. inside diameter, and having a  $\frac{5}{32}$ -in. wall. The steel is of medium carbon content. Tubing is received in cut lengths, that of the  $4\frac{1}{2}$ -in. size being the required 17-in. length.

The pieces are placed in an open-flame gas furnace in which the end to be formed is brought to a cherry red heat. After heating, the piece is placed in a chuck on a specially designed expanding machine. The carriage is moved forward until the end of the tube is brought against a stop back of a mandrel that serves as an expanding tool and is mounted on the drive spindle of the machine. The contour of the mandrel is the same as the outer circumference of the tube after expanding.

Then the chuck is raised, by an upward movement of the table control, by screws in the bed until the inner surface of the tube comes in contact with the mandrel, where it is held under pressure. The pressure of the revolving mandrel causes the expansion of the metal, the operation being continued until the proper diameter and form are obtained. A  $4\frac{1}{2}$ -in. tube is expanded to 6 in. at the point of greatest diameter.

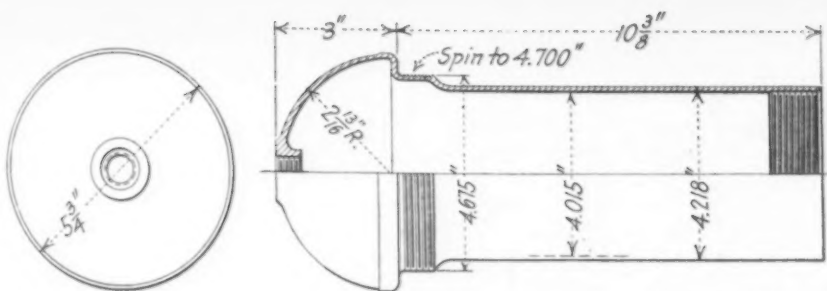
Movements of table and carriage are air controlled through control valves at the front of the machine. The drive is motor operated. There are two of these machines, for expanding different sized tubing, both built in the plant. The base of one was formerly the base of a boring mill and the base of the other had previously served as the base of a die-sinking machine.

After expanding, the tube is set in a self-locking chuck in a spinning machine and the metal of the expanded end is spun down until the end is in the form of a hemisphere. The spinning tool is held in a fixture that swings on a radius and is moved forward by a hand screw. The beds of the spinning machines formerly served as beds for hand screw machines.

The third and last forming operation is the pressing of a bead in the top of the dome. This is done on a 15-ton press, the piece being set on the mandrel in the machine.

Four minutes suffice for the three operations after the piece leaves the furnace, the forming being done with sufficient speed to avoid the necessity of reheating. All the operations are done by two men.

Machining operations follow: First the inner surface of the sleeve is bored and tapped. Then the sleeve is put on a mandrel and a hole is drilled, counter-bored and tapped in the top of



Section showing spinning operations in forming the dome head on the tubing

the dome; turning and threading operations are done on the circumference of the sleeve and the inner surface is ground on an internal grinder. Finally, a plug is screwed in the hole in the top of the dome and soldered. This is fitted with a valve for forcing air into the cylinder of the shock absorber. The sleeve then goes to the assembly bench.

### Baskets Used to Charge Electric Furnaces

BASKET charging of electric furnaces is a new development in Germany. The method is used to introduce scrap and it is described in *Demag News*. The supporting structure and regulating gear of the electrodes are mounted on a gantry-shaped bridge standing on the tipping cradle of the furnace. The bridge has an electric transversing gear so that it can be run aside and also a housing gear for lifting the cover of the furnace which can be carried to one side together with the electrode.

Basket containers, consisting of a light bottom of hoop iron and wire netting and a bell or body of cylindrical shape, are used for charging. While the cover and the electrodes are run aside, the basket containers are dumped by a crane into the furnace, and by a special contrivance the bell is separated from the bottom of the container. The bell is then withdrawn, leaving the hoop iron bottom in the furnace. Several advantages for this method of charging are claimed.

### Relief for the Farmer

**"THE Georgia Convention on Saturday adopted a resolution petitioning Congress to appropriate \$30,000,000 to be loaned under proper regulations to aid in developing agricultural interests of needy Southern planters."**

Not an extract from the day's grist of news, but a quotation from THE IRON AGE of Feb. 6, 1868.

How history repeats itself in periodic worries over technologic unemployment, excess capacity, import threats and other industrial ills is well shown in a perusal of THE IRON AGE over the last seven and one-half decades.

The fact will be developed in the forward looking anniversary number which we shall bring out on Nov. 20 to commemorate the completion of 75 years of service.

# Design and Construction of Hot Saws for Cutting Heavy Sections

By A. B. PEARSON

Engineer, Carnegie Steel Co., Homestead Works

IN sawing metals such as steel there are two distinct fields, that of sawing steel cold and that of sawing steel hot. When sawing steel cold, the heat developed is not an aid to the cutting and must be kept within limits. When sawing steel hot, the heat must be created at a rapid rate to insure successful cutting.

In sawing steel hot it is necessary to create this difference in temperature and consequent hardness between the cutting tool and the material being cut, and it is clear that without this difference in hardness no cutting could take place. Therefore in hot-sawing the rotating steel disk has two functions to perform, (1) to heat the steel by friction, and (2) to remove at least a part of the steel so heated.

Some cooling agent has to be used to cool the saw blade for continued cutting. It is evident that the friction required is in inverse proportion to the temperature of the steel sawed. This method of cutting steel is used extensively in steel manufacturing plants and warehouses.

This is abstract of a paper read in Chicago in September, before the Iron and Steel Division of the American Society of Mechanical Engineers.

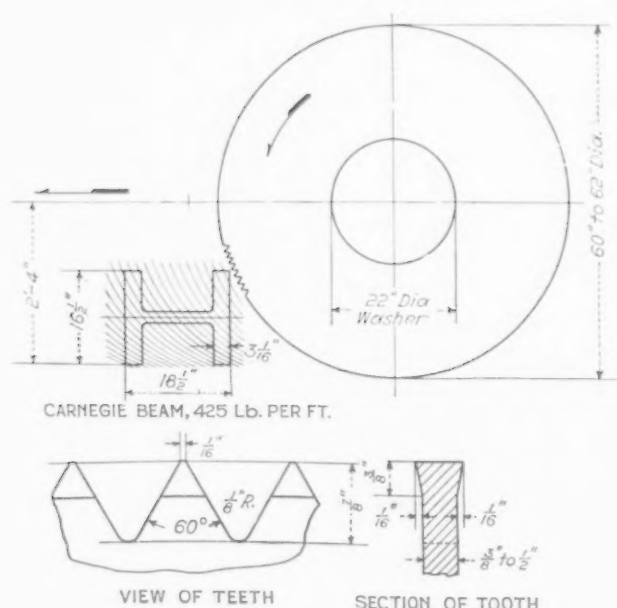


Fig. 1. Saw blade for cutting hot steel

In steel mill practice the name "hot saw" is applied only to a sawing machine used for cutting red-hot steel coming directly from the mill. The name "cold saw" is applied to a similar machine used for cutting cold steel coming from the cooling bed or the stock pile. In both of these machines the cutting is done with a rotating saw blade or disk having a peripheral speed of several thousand feet a minute.

## Forms of Saw Frame Used

Early high-speed hot saws used for cutting steel were of the stationary-frame type, having a manual-feed arrangement. For light work these saws have been and still are efficient. But, as the material to be cut has increased in size, the manual feed had to give place to some sort of power feed. With the introduction of the power feed, a greater ease in the manipulation of the feed was accomplished. However, the power feed brought a less sensitive feed movement.

The stationary-frame type of saw makes it necessary to feed the material to the saw while cutting. This is satisfactory for short lengths, but for long lengths the material has to be clamped in position for each cut. The clamping caused delays in production and therefore a change became imperative. However, the disadvantage could not be easily overcome without a radical departure in the design of the saw.

Thus came into use the drop saw and the pendulum saw, which allow the material to be stationary while the saw frame is moved relative to it. The drop saw, also called the balance saw, is fed from the top down. The pendulum saw is fed from the side in a swinging fashion. The drop saw is now used for cutting rails and material of a similar character.

## Not Suited for Some Sections

With the drive and the saw blade mounted on opposite ends of a walking beam, the drop saw is fed by tilting the walking beam so that the saw blade comes in contact with the material to be cut. For steel with a varied rectangular cross-section this saw is not suitable except for narrow widths.

The pendulum saw, although having the advantage of cutting from the side, has other features not conducive to good design. The two most outstanding are



SAWING is an ancient art and it may be said without fear of contradiction that its origin dates from primeval times. A stone or a shell with a ragged edge may have served as the implement, and the pressure or feed, as well as the speed, were then, as now, very important factors in the undertaking. Other methods of cutting have been found, but the abrasion process is still the one that is most generally employed for cutting heavy material to length. In the use of this process, as in sawing, the cutting tool is generally harder than the material being sawed. The author describes saws for cutting hot and cold metals and gives results of tests on a variety of saws.

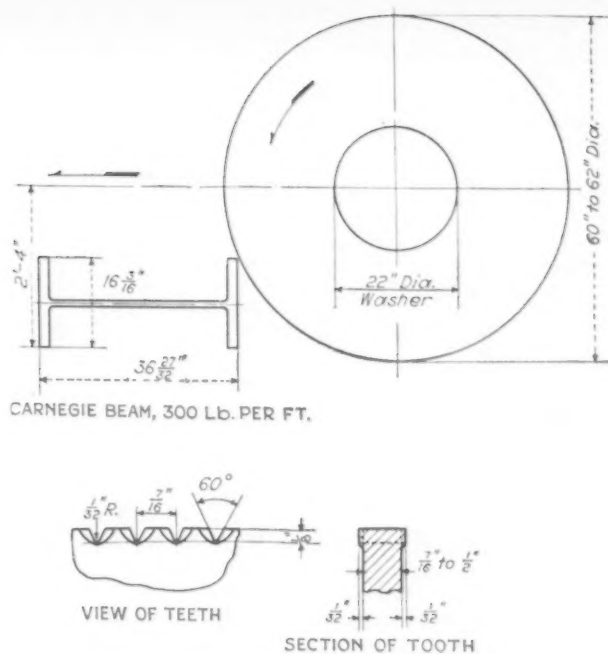


Fig. 2. Saw blade for cutting cold steel

the high suspension and the vertical belt drive, the latter feature being perhaps the more objectionable. It should be said, however, where floor space is limited the pendulum type of saw may be justified.

#### Sliding-Frame Saws

The sliding-frame saw has met with success, particularly when used for cutting heavy structural-steel sections. There may be a number of details that can be improved or altered to suit different conditions, but the design of the sliding frame moving horizontally on a stationary base is a basic principle in design that will remain.

The so-called sliding frame is really a rolling frame for the larger saws, because the frame rolls on a stationary base plate. The belt-driven saw of this type has a motor mounted on the frame with a belt from the drive pulley to the saw arbor. The saw blade is mounted on one end of the arbor shaft, which permits a rapid change of saw blades. However, a heavy construction is required, as the load is overhung and one-sided. The horizontal travel of the saw frame is ordinarily about 6 ft. for saws now used for cutting the heavier structural beams.

With this travel it is evident that the saw frame must be long and also heavy, not only for strength, but also to balance the loads when the saw frame is in one of the two extreme positions. The saw frame must be

heavy to absorb the minute rapid vibrations set up by the rotation of the saw blade.

#### Advantages of Sliding-Frame Type

Saws of this type have advantages, the most important being that the saw frame is outside and adjacent to the table on which the material is moved to sawing position. This permits a ready means for the disposal of crop ends and scrap into a pit located immediately under the table. In mill practice this is a very important factor, where several thousand tons have to be sawed in a day. The sliding frame lends itself equally well for sawing either hot or cold steel.

Another sliding-frame saw has met with considerable success. The frame of this type of saw is built in a goose-necked fashion, the lower part extending under the table, which supports the material as it is being cut. The saw-drive motor is mounted directly on the saw arbor, thus eliminating the belt. This saw has so far been used only for sawing cold material.

#### Feed of the Saw

In general the larger hot saws are equipped with hand-controlled power feed having a hydraulic or hydro-pneumatic, and, in later years, an entire electric arrangement. The feed is arranged so that the movement is variable in speed when the saw blade is making the cutting stroke and either variable or constant in speed on the return stroke.

#### The Saw Arbor

The saw-arbor bearings as applied to the belt-driven saw have gone through more stages of trials and changes than any other part of the saw. At a speed of approximately 1500 to 1800 r.p.m. and a comparatively heavy load, the ball and roller bearings have here found a ready application. This, however, has not been accomplished without some grief, more due to error of application than to any inherent fault of the bearings.

To the operating man the saw blade is the most

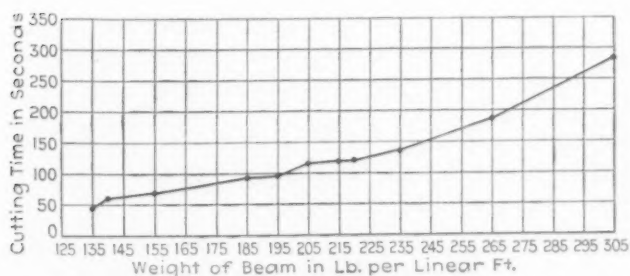


Fig. 3. Relation of weight of beam sections and cutting time

important part of a saw. Because of rapid wear and replacement it is a source of high upkeep cost.

Fig. 1 shows a saw blade used for cutting hot steel and the relation of the saw blade to the beam about to be cut. The teeth of this saw blade are machine punched and later widened with an air-driven swaging tool. Swaging is necessary for running clearance, as the sides are not hollow ground, although a saw-tooth grinder is used to shape the teeth. Hardening of the teeth to about one-half their depth prolongs the service of the saw blade. Running at a speed of 18,000 ft. a minute, this saw blade is used for cutting red-hot steel.

(Chemical composition: C=0.30 to 0.36 per cent, Mn=0.45 to 0.60 per cent, P=not over 0.04 per cent, S=not over 0.04 per cent, Si=0.06 to 0.08 per cent. Heat treatment: Heated to 810 deg. C., held  $\frac{1}{2}$  hr. and air cooled, then heated to 500 deg. C., held  $\frac{1}{2}$  hr. and air cooled.)

Fig. 2 shows a saw blade used for cutting cold steel. The early cold saws had blades without nicks, the edge of the blade being smooth. Later it was found that by nicking the cutting edge a faster cutting could be obtained, and this is the practice at present. The nicks as shown are driven with an air chisel, which also widens the edge of the saw blade. The peripheral speed of the blade should be from 24,000 to 26,000 ft. a minute for successful cutting.

(Chemical composition: C=0.24 to 0.30 per cent, Mn=0.40 to 0.50 per cent, P=not over 0.04 per cent, S=not over 0.04 per cent, Si=0.06 to 0.08 per cent, Cr=0.80 to 1.00 per cent, V=0.12 to 0.20 per cent. Heat treatment: Heated to 865 deg. C., held  $\frac{1}{2}$  hr. and air cooled, then heated to 570 deg. C., held  $\frac{1}{2}$  hr. and air cooled.)

Both saw blades are flat disks sheared from a rolled plate. The plate is rolled in a plate mill shortly after a roll change, to get as uniform thickness of the plate as possible without having to grind the sides. It should be noted, however, that the grinding of the sides, particularly the hollow-ground sides, with milled and ground teeth, must necessarily, if correctly done, produce a better balanced blade than a disk not so treated.

#### Saw Performance

A comparative test was run between a motor-driven belted saw and a direct motor-driven saw. This was done to determine the relative power consumption between the two saws cutting identical beams. The test showed that the belted saw requires from 40 to 45 per cent more power to cut a given beam than does the direct motor-driven type of saw. In sawing, however, the actual cutting time is generally only a small fraction of the running time, and this has to be considered in a fair comparison of two saws.

#### Cutting Time

A test was run to determine the actual time it takes to saw cold-steel beam sections under normal running conditions. The saw blade used was of the cold-saw type, Fig. 2, 61 in. diameter by  $\frac{7}{16}$  in. thick, running at a peripheral speed of 26,000 ft. a minute. The saw

was of the belted type, driven by a 300-hp. motor. With the hand-operated feed control the saw-drive motor load was held as near the rated motor capacity as possible. The weight of the Carnegie beam sections sawed and the average cutting time in seconds are given in the chart, Fig. 3.

The total cross-sectional area of beams as shown is 663 sq. in. and the total cutting time is 1319 seconds. Therefore, the average cutting is approximately  $\frac{1}{2}$  sq. in. a second. The cutting time of this saw was estimated at 2 sq. in. a second for sawing cold steel. The saw capacity was based on experience in sawing standard structural sections, and it is evident that the estimated capacity was too high.

The path of the saw blade as indicated in Fig. 1 shows that cutting takes place in both flanges as well as the web simultaneously, and this together with the heavier section accounts for the difference in time. Sawing beams of a similar section weighing more than 305 lb. per ft. will cause the saw blade to wear rapidly, and as the cutting is retarded the end surfaces of the beam become hardened.

#### Discussion on Saw Blades

ABILITY of the blade to stand the punishment of steady work under high pressure is the important factor in connection with the selection of blade material, according to George C. Farkell, superintendent of rolling mills, National Tube Co., Lorain, Ohio. He cited a number of variables having definite influences upon the life of a saw blade. Among these are temperature of steel being cut, cooling of the blade, rate of making the cut, circumferential feed of the saw, shape of the teeth, etc.

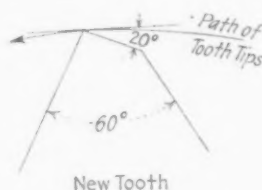
He told of using a 50-in. diameter saw in cutting round blanks for making seamless steel tubing. The rounds varied in section from 20 to 95 lb. to the running foot. This saw, which has a blade  $\frac{1}{4}$  in. thick, has a circumferential speed of 16,000 ft. a minute. The saw is ground after getting dull, about  $\frac{1}{4}$  in. being removed from the diameter each time in returning it to the cutting condition. This process is continued until the saw reaches a diameter of about  $41\frac{1}{2}$  in., at which time it is discarded because of clearance limitations in doing the work. At this diameter the peripheral speed is about 13,500 ft. a minute.

#### Teeth Upset at Leading and Trailing Edges

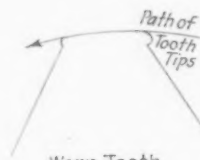
The teeth of this saw have a 60-deg. included angle, with the tip ground off to a 20 deg. angle, about as shown in the sketch. Use of the saw results in dulling it eventually to the condition shown at the right, where the steel has a small upset at the leading or cutting corner of the tooth and a considerably greater upset condition at the trailing edge.

This saw can cut the largest rounds at the rate of about 6 sq. in. of sectional area a second, as long as the teeth are kept cool. As they get hot the power

(Concluded on page 1277)



New Tooth



Worn Tooth

Form of a new tooth and how it wears in service. The original 20-deg. clearance angle disappears





Charles M. Schwab

## Stability in Prices and Production a Prime Need

By CHARLES M. SCHWAB\*

THE steel industry today is more actively engaged than ever before in my long experience with it in the cultivation and expansion of its markets, in the stabilization of its policies and in the improvement of its plants and organization. Moreover, it is preparing to meet a greater future demand for our products than we have ever realized in the past.

We are not concerned with the cross currents of what I would call "short-term pessimism." Nor are we over-anxious about the exact date when orders will pile up on our doorsteps. Ours is a business that deals in the fundamentals of material civilization and in the essentials of human advancement. And when I say that we are moving forward, I am not overlooking the fact that at the moment there are many at home and abroad who can see things only through spectacles darkened by immediate but transient gloom.

Some are inclined to think because business pauses from time to time in its forward course that our natural optimism has somehow been tricked. At the first signs of recession the timid become pessimistic, assurance gives way to uncertainty and fear. Those with faith and courage based upon known facts refuse to accept this philosophy; they recognize that such pauses really make for sounder progress. It is only in a stagnant civilization that changes do not occur. Moreover, it is only during such periods that we can see just how real are the underlying foundations of our economic prosperity.

Progress is born out of the pains of economic adjustment. The past 12 months are the first real test we have had of our new "American Prosper-

ity," by which I mean the basic factors underlying our higher standards of living, including mass production and distribution and high wages. It is significant that there has not been uncovered in our economic foundation any basic structural failure. Because of this I believe that business revival will bring to this country a larger measure of prosperity than the American people have ever before known.

### Price Stability Essential

There are two factors entirely in the control of the steel industry itself which, regardless of fluctuations in general business, largely determine our success as an industry. One of these is price stability, the other is stability of production. I think we have made real progress in the increasing recognition of the importance of these two factors on the part of steel men generally. Occasionally, however, lapses occur and this seems to be an appropriate time to point out that several months ago price instability was permitted to come into our commercial structure. More recently that situation has been largely remedied. Sharp-shooting has been limited to a few lines and the general strength in most ranges of the price structure has brought a better tone to our industry.

Business common sense demands that we keep a sane and balanced view in our selling policies. This industry has always proceeded on the basis that as methods of manufacture are improving from year to year, the public will get the benefit of economies in an orderly lowering of prices. That is an entirely different process from the destructive competition which we experienced in the earlier stages of recession. I am glad to state that the cost sheets soon won

this skirmish, and under-cutting was minimized.

### Reserves Protect Stockholders and Wage Rates

We must not forget that what we have been able to do in weathering the recent recession has been largely due to the fact that we have built up reserves from a profitable past; during which period we have been able to reach a basis of reasonable stability in every phase of our business. We stabilized costs, we stabilized employment and our manufacturing programs. If we are to maintain this stability which is, after all, the foundation of an advancing prosperous industry, we should not have to draw upon these reserves that we have built up through good management to such an extent as to dissipate them in unsound, unbusinesslike methods in marketing our products.

The ant and the grasshopper story is as good today as ever. Reserves are necessary for the orderly conduct of business during slack periods. They are built up not to be destroyed by price instability, but for the protection of the wage scales of the employees and the dividends of the stockholders. This is sound practice and I believe the public recognizes it as such.

### Should Avoid Overproduction

It is equally good business not to create unreasonable capacities. We shall always go forward in increasing our capacities in line with the reasonable demands of our business. But I want to sound again the warning note which I have mentioned in the past that if we plunge headlong into a program of unreasonable expansion only one thing will result—overproduction. We cannot afford to squander our

\*Abstract of address before American Iron and Steel Institute at New York, Oct. 24



resources either by price cutting below the profit line or by overproduction beyond the demand line. Furthermore, I do not think we have considered seriously enough the limitations of the ore supplies upon which our industry is based, and any uneconomic practice in the way of overexpansion or inadequate returns will result in a dissipation that cannot be replaced.

#### Wage Rates Maintained

It was stated six months ago at our meeting here that there would be no cut in wage rates, and that policy has been maintained. Business men generally have refused to be stampeded into following the vicious wage slashing practice of former periods of business recession. They have recognized that the retention of our wage scales would hasten return to prosperity as soon as business again begins to accelerate. Of still greater importance is the fact that the retention of the wage rate removes much of the worry from the mind of the employee. It protects his standard of living as soon as conditions become better.

The second point of progress in this policy has been the substantial avoidance of the traditional practice of wholesale layoffs. Industry, by and large, has retained its trained personnel, spreading out the work there is to do so that as many as possible might have some employment. Not only has this policy alleviated what otherwise might have been a bad social condition, but it has also placed our industries in the position of being ready to resume full-scale operations without the inefficiencies of training new people.

#### Advantages of Part-Time Employment

The part-time employment situation does not, of course, represent a normal or desirable condition, but it is a preferable alternative to wage reductions and large scale dismissals, and it guarantees food and shelter for many more than would be provided for if one group were sacrificed in order to keep others on a full-time basis. When conditions are slack, people in all ranges of life are less prosperous, but business leadership in the present situation through this distributed employment and maintenance of the wage rate, is keeping our economic organization in orderly condition, and guarantees the purchasing power of the public as soon as better conditions resume.

#### The Influence of the Stock Market

We cannot ignore the part which the stock market plays in the creation

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**B**USINESS common sense demands that we keep a sane and balanced view in our selling policies.

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**We cannot afford to squander our resources either by price cutting below the profit line, or by overproduction beyond the demand line.**

of current conditions. At first everyone blamed the crash. Then there was a tendency to say that the market simply reflected the business situation.

Neither point of view is entirely correct. Hundreds of thousands of persons have seen paper profits and actual profits wiped out of existence. This has had a drastic effect on purchasing power for the time being. Essentially, current prices of securities at any given time, whether high or low, are of secondary importance. Momentarily the rise or fall of such prices serves to overstimulate the public mind.

We looked through rosy glasses in 1929 and quickly changed them for blue glasses. If we look through a plain, clear pair of spectacles we will see that the widespread ownership of securities rests primarily with the investors and represents partnership in the great industrial enterprises of the country. The share of the investor in this ownership of enterprises is not changed in its real values. As business improves the general public will benefit not only from better employment and trade, but also through stock ownership which will share in the profits realized from increased industrial activity.

#### Ingot Production of 40,000,000 Tons

In the steel industry we have good reason to be cheerful. Ingot production for this year will be around 40,000,000 tons. That is within 5 per cent of the average production for the past ten years. Let's forget 1929 and get our feet on the ground. Of course, we want another record year. That will come, and in a few moments I shall indicate the forces which will

make it come. Meanwhile we can take pride in the fact that this year 1930 is right in line with the average of the best ten years of our history.

All of us are learning more and more how to benefit from our experiences and how to put them to practical use. We have learned during this recent period of depression how to do things much better than before. Business has been put on its mettle and is working harder today than it has worked in many years. It is probably true that never before in any like period have the fundamental industries of the country put themselves in a more wholesome position, in production, in distribution and in financial respects to profit by the expansion which will come sooner or later.

#### Foundrymen's Convention in Chicago in May

Announcement has been made by the American Foundrymen's Association that the 1931 annual meeting will be held at the Stevens Hotel, Chicago, the week of May 4. This decision was reached by a unanimous vote of a special committee, appointed to consider the question, at a meeting held at the Hotel Statler, Buffalo, Oct. 17.

Coupled with the decision of the special committee to meet in Chicago next year was the recommendation that the 1932 annual meeting be held in Philadelphia and that an option be secured on the new Philadelphia Convention Hall, now under construction, for a convention and large exhibit the first full week in May 1932. It was further recommended by the committee that, in the future, all annual meetings of the A. F. A. be scheduled for the first full week in May.

Cleveland branch of the National Die and Special Tool Builders Association has elected permanent officers as follows: A. E. Shepard, Sommers & Adams Co., chairman; F. C. McKinney, McKinney Tool & Mfg. Co., vice-chairman; C. R. Decker, C. F. Laganke Co., treasurer; A. J. Mertz of Danly Machine Specialty, Inc., was retained as temporary secretary. Two committees were appointed, a membership committee with H. E. Henry, Tools & Gages, Inc., as chairman, and a standardization committee to work out standardized work sheets for jigs and fixtures as follows: E. B. Bunell, Bunell Machine & Tool Co., chairman; H. E. Henry, Tools & Gages, Inc., and E. G. Voelker, C. F. Laganke Co.





## Iron and Steel Leaders Forecast Business Betterment

**I**F one year ago the leaders of the iron and steel industry were deceived by the apparent soundness of business, as contrasted with the late speculative excesses in the securities market, and failed to foresee the severity of the depression that followed, it is evident that they are now squarely facing the serious problems confronting them and, what is more important, their attitude is not one of resignation to the inevitable. Rather, they have the renewed confidence that springs from dispassionate analysis of the naked facts and the formulation of policies calculated to meet the utmost demands of the time and to pave the way for recovery.

In a word, views voiced at the thirty-eighth general meeting of the American Iron and Steel Institute, held at Hotel Commodore, New York, Oct. 24, were constructive, though not offered as panaceas, and were uniformly hopeful, though not fantastically optimistic.

President Charles M. Schwab counseled the institute against "short-term pessimism" and, although making no prophecy as to precisely when the upturn would come, declared that the next business revival would bring this country a larger measure of prosperity than the American people have ever known.

### Industry's Methods Have Stifled Business

The most encouraging opinion offered was that of James A. Farrell, president of the United States Steel Corp., who stated that it is within the power of steel companies to bring about a revival within 60 days if they will make up their minds to be fair with each other in competition. In his view, the steel industry would today be operating at 70 to 75 per cent of capacity if it had not killed business through ruthless competition and too much talk about unemployment.

T. M. Girdler, chairman-president, Republic Steel Corp., pledged his

company to the 60-day program suggested by Mr. Farrell and expressed the belief that the steel industry had been suffering from a state of mind. Most price cuts, in his opinion, originate in the imagination of the salesman.

Referring to the state of business, he said: "I think nothing is worse

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**C**OUNTRY is headed for greater prosperity than it has ever known, declares President Schwab of American Iron and Steel Institute.

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Revival can be brought about in 60 days if competitive excesses are wiped out.—James A. Farrell.

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Fifty per cent production cannot continue, because national demands exceed 50 per cent.—Myron C. Taylor.

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The steel industry must take care of its own unemployed.—President Schwab and Myron C. Taylor.

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Problem of technological unemployment must be solved.—Myron C. Taylor and Nicholas Murray Butler.

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today than it was a few weeks ago. I think everything shows signs of being a little better."

Similarly reassuring regarding the immediate outlook were the remarks of Myron C. Taylor, chairman of the finance committee, United States Steel Corp., who was one of the speakers at the banquet. He said:

"This country cannot long survive on a 50 per cent capacity basis, because national demands of the country are more than 50 per cent. For that reason it seems to me that we are now about reaching the low point and will see a turn for the better very soon."

### Wage Rates Must Be Maintained

Both Mr. Farrell and President Schwab emphasized the importance of maintaining wage rates. The former declared: "I think that the greatest thing that we have done in the industry and for the country was to take the position last spring that there would be no reduction in wages in the steel industry."

Another policy commended by various speakers was the avoidance of wholesale layoffs by spreading the available work among as many as possible. While this plan is good so far as it goes, it does not reach those who have no jobs at all. "We ought," urged President Schwab, "in our various establishments throughout the country, where our first interests lie, where we have our works and our working men, to take such measures as may be necessary to carry everybody connected with the steel industry safely through this depression." Even more pointed was the counsel of Mr. Taylor, who said: "Let it be said of the steel industry that none of its men was forced to call upon the public for help."

### Must Adjust Man to the Machine

In addition to discussion of immediate problems, attention was focused also on more fundamental questions.



President Schwab stated that the depression had failed to disclose any basic structural failure in our economic foundation and voiced his faith in stabilization of prices and production and in extension of markets as a means of bringing the steel industry to new high levels of prosperity. On the other hand, both Mr. Taylor and Dr. Nicholas Murray Butler, president of Columbia University, who also spoke at the banquet, saw a new major problem barring the way to full economic recovery. The means of production, said Mr. Taylor, seem to have progressed beyond the capacity of the community to consume and it is the duty and responsibility of industrialists to adjust the man to the machine.

"The Old Testament records instances where peoples of nations submitted to bondage in lands far from their homes because of the need for food. Today in America we are apparently oversupplied with food, materials and products, and it makes us unhappy. Why should it?

"It is because the new inventions and systems of production have so intensified output that we have for the moment got out of step with consumption. I was recently asked if the remedy is not to destroy the machines. I read in the papers another suggestion that we close our laboratories. These are not the solutions.

"The things we have accomplished in a brief period can be well illustrated by recalling to mind how many great privileges and luxuries are now enjoyed by the whole community. We



Myron C. Taylor

have elevated man to a great variety of material comforts that he never before enjoyed and taken from his shoulders the burdens that he carried so patiently down through the ages.

"Are we to take a backward step? No. What is our duty, we who are recognized as leaders in industry? We have a duty. It is up to us to adjust men to the machines. It is up to us to make that adjustment at once. The

adjustment can be helped along if the work is equally divided, as nearly as possible, among those best prepared to do it."

#### Problem of Distribution Demands Solution

Dr. Butler addressed himself to the same question, when he said: "We have been so concerned with economical production that we have carried total output to a height where it is out of keeping with distribution and the ability to consume." The same forces of scientific invention and development, of organization and industrial energy, which have been applied in the creation of the modern economic system must be brought to bear upon the solution of the problems of more equitable distribution and industrial idleness, he declared.

The International Labor Bureau, he said, reports 10,000,000 out of work in the civilized world. World-wide economic distress is inviting more or less revolutionary expressions. The world is in conflict between our system and substitutes proposed for it. It is in the acute stage of an era entered by mankind about 1890, when new tendencies resulted in the dismissal of Bismarck by the then young Kaiser Wilhelm of Germany.

#### World Trying to Adjust Itself

At the moment the world is trying to adjust itself to these new economic and political tendencies, which find their origin in the Marxian teaching that the place to look for the explanation of events is in the economic

## Experiences in Past Depressions Show Value of Cheerfulness—President Schwab

I HAVE been through, as few of you have, many or several of these business depressions, when the situation looked hopeless to us. I remember so well in 1892 when we felt that there was no future for the steel business. But I have never seen a depression that has not had its corresponding advancement within a reasonable period of time.

I remember in 1892 and 1893 when, at the Carnegie company we were in the very depths of despondency by reason of bad business conditions. To give you some idea of that I need only remind you, and Mr. Farrell well knows it all, that the Carnegie company sold about a million tons of rails that year delivered in Chicago from Pittsburgh at \$16 a ton; that I myself sold the American Steel & Wire Co. 800,000 tons of billets for \$13.20 a

ton; that we were very glad to take a contract to convert pig iron into billets for \$5 a ton and take our profit out of that.

Boys, this is not an unusual condition, nothing like what we saw then, and yet the year 1900 was one of the greatest periods of prosperity we have ever had in this country.

At that time (1892-1893), when I was feeling, perhaps, bluer than at any other time in my life, Mr. Carnegie sent me a picture. I call it the Laughing Monk. It hangs in Mr. Grace's board room up at Bethlehem. I have lugged it around as an object lesson to everybody in the industry, when bad times come.

And Mr. Carnegie wrote me a letter and he said, "Put this old monk in your board room and every time you are inclined to be depressed or blue look at this

old fellow, who has nothing but the robe upon his back and a girdle around his waist, and see how he laughs and how happy he is, and be governed likewise. You are going to be prosperous even though you apparently have nothing now. The future will show greater things for you. And remember," he said, "that good judgment and good business are possible only when you are in a very happy frame of mind, when you are feeling good and when you are feeling optimistic."

The purpose of this little after-talk was just to say to you boys: Let us put our shoulders to the wheel, let us be optimistic, let us make up our minds we are going through this depression with all the energy and with all the talent and with all the ability we have.



sphere. "I dissent absolutely and profoundly from that view," declared Dr. Butler, "but it has seized upon the imagination of millions on millions and has turned Russia into a huge laboratory of experimentation that challenges the existing order." This, he said, is the most extraordinary happening by far that has taken place in the last 150 years.

While Dr. Butler does not regard economic forces as the one dominant influence in history, he stated that they are a powerful influence. Millions of people, he said, are living under forms of government which we had supposed had been put behind us hundreds of years ago. Dictatorships of one kind or another are being submitted to as the easiest way to obtain efficiency and relief from industrial dilemmas.

#### Factors Contributing to Present Depression

Our present economic ills, according to Dr. Butler, are traceable in large part to the destruction wrought and the liabilities incurred by the great war. They also have grown out of technological unemployment. Every time a labor-saving device is adopted, labor is sent elsewhere to seek the income displaced. With the gap between production and consumption widening, it is no answer to offer the unemployed a dole from the public treasury. That is simply to dodge the issue and not to meet it. It merely increases the difficulties of those who are to come after us in meeting the problem.

The question of monetary standards is likewise a factor in the current situation. The issue, which was the dominant one here in the Bryan days of 16 to 1, is back again—not so much

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**H**UMOROUS touches were lent to the discussions when President Schwab ascribed the large attendance to the fact that those present had nothing else to do, and when Mr. Farrell addressed the assemblage as "members of the Society for the Improvement of Conditions in the Steel Industry."

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at our door as at the door of the world, said Dr. Butler. He quoted Sir Josiah Stamp as stating that the indebtedness of Great Britain had been increased \$7,500,000,000 in the past two years by the fall of silver.

Dr. Butler also mentioned tariffs and the allied war debts as requiring downward revision. He deplored tariff obstacles to international trade between bits of country with uniform climate and similar economic organization. He forecast the eventual bringing about of an economic union of Europe. Briand, he said, is paying us the compliment of following the path successfully marked out by the United States of America, with its free trade policy within its far-flung boundaries.

#### Our Institutions at Stake

In urging the seriousness of the politico-economic situation confronting us, Dr. Butler said: "You can offer no stronger invitation to those who would destroy our system than to be indifferent to attacks being made upon

it and to fail to rebut those attacks with facts.

"Our individual liberty, our social institutions and our political fabric may very well be at stake within the next 100 years, if we do not prove to ourselves and to our children that the principles of individual liberty and economic freedom can be made to work with such fairness to all men that they will justify themselves for generations to come."

Essington Lewis, managing director of the Broken Hill Proprietary Co., Ltd., Melbourne, Australia, was an honor guest at the banquet and made a brief address. The ore that his company mines, he said, has a metallic content of 65 per cent iron and manganese and is shipped to Japan, Europe and the United States.

General John J. Pershing was also a guest of honor, but did not speak. In introducing him to the audience, President Schwab said: "The steel industry is like General Pershing's army—it never goes back. It may go back a little at times, but only before further advances."

#### Institute Medal Presented

Prof. Herbert F. Moore of the University of Illinois was presented with the American Iron and Steel Institute Medal, awarded for the best paper delivered before the organization in the past year. The subject of Professor Moore's paper was "Fatigue of Metals," and it was delivered at the meeting of Oct. 25, 1929.

The attendance at the banquet was 1542. The directors of the institute, in their meeting during the day, failed to fill the two vacancies on the board. The technical papers will be published in abstract, with their discussions, in this and subsequent issues of THE IRON AGE.

## Steel Industry Is Suffering From a State of Mind—T. M. Girdler

**I** THINK the steel industry is suffering from a state of mind. I think the worst thing that we have to contend with in the steel industry today is what is commonly called the meeting of conditions. All my salesmen and all your salesmen come in and say: "I took an order down here or I can take an order down there, but I have to take it at a certain price to meet conditions. Some one else has made that price."

Sometimes, I don't think very often at that, the buyer has made that con-

dition or has intimated that some one else has made it. I think it generally happens right in the mind of the salesman himself. I think two-thirds of the price cuttings that are made are made because the salesman is fearful that somebody may be thinking along the same lines that he is thinking, and if they were thinking that way, why, he had better try and outthink them a little bit and get the price still lower. I do not think that we have the faith in each other that we ought to have.



T. M. Girdler



# Sanity in Competition Is Prerequisite of Recovery

By JAMES A. FARRELL\*

**W**E can have stability in the steel industry, but we have got to get rid of demoralization first. I do not mean demoralization in business generally, so much as I mean a lack of consideration for the rights of the rank and file in the industry. Somebody builds an open-hearth furnace on the end of a group of furnaces. Then several more think they have got to keep up with the Joneses and they put a furnace in. Somebody buys a small industry, it may have been a customer; there are lots of businesses where people have customers that are responsible for a certain unit in their manufacturing plant; if the customer is lost, the unit is shut down. We should get it into our minds that cooperation does not mean superficial conversation and pleasant words. It is within the power of the steel industry to create a stable situation and to do that promptly.

## Ferromanganese Supply Threatened

The prices of steel are ridiculous, when we consider the situation in raw material. Do you gentlemen realize that if this revolution in Brazil continues, and Brazil is a larger country than the United States when it comes to area, and if turmoil continues in India, within four months you

\*Abstract of address before American Iron and Steel Institute, at New York, Oct. 24.

will be wondering where you are going to get your ferromanganese to make your steel? But still we are giving away the finished product in the meantime. Now remember that. And this business in Brazil is not going to be over in a hurry. The country is so widely scattered and the political situation differs in various places, that it is likely to be a long drawn out struggle.

It is not like Germany. I was in Krupp's office in Essen the day after the election, when Mr. Hitler brought in 150 new members of the Reichstag. Everybody was concerned about it. All these men were sitting there at lunch and were very much concerned over the immediate situation in Germany. What happened? In a day or two the old parties, that had been bitterly opposed to each other ever since the Armistice was signed, formed a coalition, and they have the most compact organization in Germany today. In the brief period of four days \$150,000,000 went out of Germany to Switzerland, to Belgium, to Holland and to England, and within another three or four days, after the situation had been composed and the old parties got their bearings, the money all came back again, and the situation politically has adjusted itself.

## European Situation Exaggerated

I only mention that because I have been asked to say something about conditions as I saw them during my recent visit to France and Germany and England. I went there with the idea that the general situation was bad. I came away with the idea that the business situation had been greatly exaggerated. They have unemployment in Germany, unemployment in England, and we have unemployment here. But if we coddle the unemployment too much we are going to have more of it. And that is about what has happened in England. The rank

and file of the working people in England today are better off on the dole than working. In France everybody is working. I asked the reason why. I attended the centenary of the establishment of the steel industry in Pont-à-Mousson near Nancy, and heard the French manufacturers talk.

Every one of these towns was prosperous, and there is a shortage of labor in France. They had to import 80,000 people from Italy to get the crops in this year. I asked, what about the shortage? Well, 1,600,000 were killed in the war; there are 1,150,000 men absolutely maimed; I saw many of them in the hospital near Nancy. And that is one reason why there is no unemployment in France. I came back with the idea that the underlying situation in Germany particularly is largely based on the expectation of having its debts canceled. I told our friends that the debt was not a Government debt, but an individual debt. The people in this country bought the Liberty Bonds.

In England they are discussing the idea of trading within the Empire. Trading within the Empire means that England must have free trade and the Colonies must buy all their materials in England and market their products somewhere else.

## Fairness in Competition Imperative

Getting back to steel conditions—we have got to rehabilitate ourselves. We have got to be fair in competition. I don't like to say that, but that is the situation in the steel industry today. Certain situations exist of which we are all cognizant. There is no reason, when bids are opened on structural steel for example and the lowest bidder is \$10 or \$11 lower than the next lowest bidder, that that thing should be continued on indefinitely.

You take, for example, large bridges, large steel bridges; they are all pretty much alike; I don't believe



there is a difference of 50c. a ton in the cost per ton of building a bridge. And yet what happens? Bids are opened and the lower bidder is \$8 a ton under other concerns whose costs are practically alike, and then the producer of the plain material is supposed to come to the rescue, sometimes out of sympathy and sometimes with the idea that he is getting something that somebody else might have got.

I have not any patience with that situation. I cannot get myself into a frame of mind that we are going to have any better situation in the steel business until there is fair competition—this idea of rushing in with new capacities because somebody has put in a string of rolls in some place, or, of buying a plant in Winnipeg, because somebody goes up and buys one in Saskatchewan.

I said last spring that the first thing we had to do was to stabilize wages, and that has been carried out. Here and there a little petty business is going on, and the people who are doing it know all about it, and I hope they will correct it. There are

one or two die-hards on the seven-day week and the 12-hr. day, but we have practically banished the practice.

#### Latent Business Would Support 70 Per Cent Output

We should be doing more business; our plants should be running today at from 70 to 75 per cent of their capacity. You might say, "Where is the business coming from?" We have killed the business through this competition of price cutting and too much talk about unemployment, and some other things in internecine warfare between the steel people. That is what has held the customers back. They want steel products but are holding back. There is latent business in this country today in iron and steel to keep our mills running 70 to 75 per cent of their capacity in these times.

I agree with Mr. Schwab that the situation is a little better than it has been, I mean from the standpoint of the recognition of other people's rights, but it is only a part of the situation. We think that bars and

plates and shapes are in a little better position, and everything is all right. We forget the thousand collateral lines that are also affected. If people want to sell cold-rolled steel at the price of hot-rolled steel, that is their business, but they should remember that they are breaking down the whole structure.

Now do we want remunerative prices and do we want more business? If we do, when a price list is published which represents cost and a reasonable profit, it should be considered as representing the market. If any of these companies publish a price list which they consider bears a fair relation to the cost of manufacturing, then the other manufacturers should take cognizance and, if they lose some business, it is only a temporary situation. We have got to get it into our minds that we are not going to have any better return, we might have more volume, but we won't increase the volume until there is genuine stability.

There are several other things that I should touch upon but do not think are necessary at this time. It all

## Extension of Steel Uses Is Our Biggest Job —Charles M. Schwab

OUR big job in the steel industry is to push forward, adding to our progressive policies in employment and management an equal intelligence in marketing and the extension of the uses of steel. Our industry is the basis for this modern age; aviation, railroads, automobiles, highways, shipping are predicated upon steel. Urban life with its skyscrapers and other fireproof buildings is built on steel construction. Farm machinery, farm implements—all the advances in agricultural equipment call for the employment of ferrous metals. Electrification, the growth of power machinery, the drilling and refining processes of oil, the radio—all make use of steel.

Our world is advancing and we shall move with it. We cannot escape progress. But it is our job to foster it and that is what we are doing right now in many different directions.

For instance, the public has become air-minded and some day soon progress in the design of airplanes to land and take off at slower speeds will give an impetus to air transportation which will be phenomenal. Steel

hangars will become as popular as steel garages.

Progressive leadership in rail transportation is calling for constantly improved equipment, more powerful locomotives, cars of advanced design. This spells a greater volume of rail traffic and increased demands for steel.

In highway transportation, competent automobile authorities are predicting that 1932 will be another record year, and highway building which today calls for a good deal of steel offers a field for more extensive use that is scarcely touched.

In shipbuilding, most of the ships on the ocean today are 10 or 15 years old and the present rate of construction is inadequate for proper replacement.

In the growth and development of city life you will find a dynamic picture of expanding uses of steel, and the skyscrapers which have become commonplace may logically be followed by the construction of detached houses made of steel.

In agriculture, the production of steel barns and homes for rural communities in quantity at reasonable prices is an immediate possibility.

In office and household equipment, the lightness, cleanliness and convenience of steel furniture are making it increasingly popular.

The measuring stick of the future may be in terms of dollars rather than tonnage. Alloy steels are rendering obsolete a great deal of the equipment now in existence in our industrial plants, giving promise of many markets in this direction. The rapid rise of alloy steels, the greater development of strength in relation to mass, may lead to very much lighter materials in all forms of construction. Steel may advance more rapidly than the gross tonnage may indicate, while the industry produces a lighter and more valuable steel which is of greater service to the public.

Those of us who have been many years in the steel industry have been through many ups and downs. We have seen wonders come to pass. The great potentialities which I have merely indicated by the brief mention of them are no more astounding in their possibilities than the changes in the past 25 years.



gets down to one thing: Are we going to blow the froth off the situation and be fair with each other in competition?

Instructions begin with the executives, and then they percolate down until the salesman on the street gets the idea.

I said last spring at this table that I did not believe that there was a single steel company in the country that would earn its full common dividend in the last half of this year. There may be one or two. I forget the man's name who says check and double check. (Laughter.)

#### Need Common Sense, Not Ethics

As Mr. Schwab said here, and what he said was true, either at this meeting or at some other meeting, that Farrell is a serious-minded man, I tell you I am a serious-minded man when it comes to conserving profits. I am associated with a company that has a capacity of 27,750,000 tons of ingots. I am employed in the capacity of president of that company. Do you realize that every reduction of \$1 a ton, if you spread it over the entire production for a year, is \$27,-

750,000? And you only have to get the price down \$4 a ton when you have wiped out \$100,000,000, and the same applies to every one of these companies here irrespective of what their tonnage is, all suffer in a like way.

If we take this thing seriously and take our bearings today and follow current prices, we will get somewhere. We don't need a code of ethics, we need common sense.

#### Can Bring Revival in 60 Days

I am a student of business, and a student of international business as well as domestic business, and I am absolutely convinced that it is within our hands here that in a period of 60 days we can get this business back where it belongs and get better prices, and I want to tell you, gentlemen, that that means a little purgatory for some people and a little discontinuation of this erratic competition. If a man wants an order in England or in Germany or France for structural steel, the difference is three ha'pence a ton. But with us, several dollars a ton.

Some big public utility comes along and wants a building. Their business is regulated by the state, their profits are assured absolutely, they know what they are going to get. And instead of paying a fair price they buy it at several dollars a ton less than cost. That becomes known to everybody in the business. The next comes along, several dollars a ton below cost again.

We should change our front in this situation and make up our minds that every company is just as good as every other company, and is entitled to fair competition, otherwise I see no hope except a waste of raw materials.

It all gets back to one thing, without any further elaboration, and it is just this: that we can resuscitate our business, the steel business, from the parlous state it is in at present to a revival within 60 days if we cooperate. Cooperate. It is a word that you feel like throwing overboard, because it has been kicking around now for a quarter of a century, but there is a definition of cooperation, and that definition is, honesty in business.



STEPHEN BADLAM

#### Authors of Institute Papers

Stephen Badlam is a consulting engineer in Pittsburgh, and his paper was entitled, "Some Recent Developments in the Cold Rolling of Strip Steel." E. C. Bain, metallurgist, research department, United States Steel Corporation, Kearny, N. J., discussed, "The Structures of the High Chromium Stainless Steels and Irons."

Dr. A. W. Simon, Tennessee Coal, Iron & Railroad Co., Birmingham, had a paper on "A Recording

Dust Concentration Meter for Blast Furnace Gas," and D. M. Petty, Bethlehem Steel Co., Bethlehem, Pa., one on "Transportation Within the Steel Plant."

"Scope and Efficiency of Dry Cleaning of Coals" had two authors: Major K. C. Appleyard, managing director, Birtley Iron Co., Ltd., England, and Edward O'Toole, general superintendent, United States Coal & Coke Co., Gary, W. Va.



E. C. BAIN



EDWARD O'TOOLE



A. W. SIMON



D. M. PETTY



K. C. APPLEYARD

## Builds Heavy Grinder for Sheet, Bar, Plate and Other Rolls

THE Landis Tool Co., Waynesboro, Pa., is announcing a new machine for grinding and regrinding rolls of many kinds, including sheet mill and tin plate, cold and hot strip, bar mill and steel plate rolls. The bodies of the rolls may be ground straight, concaved or crowned; and the roll necks may also be trued on the one machine.

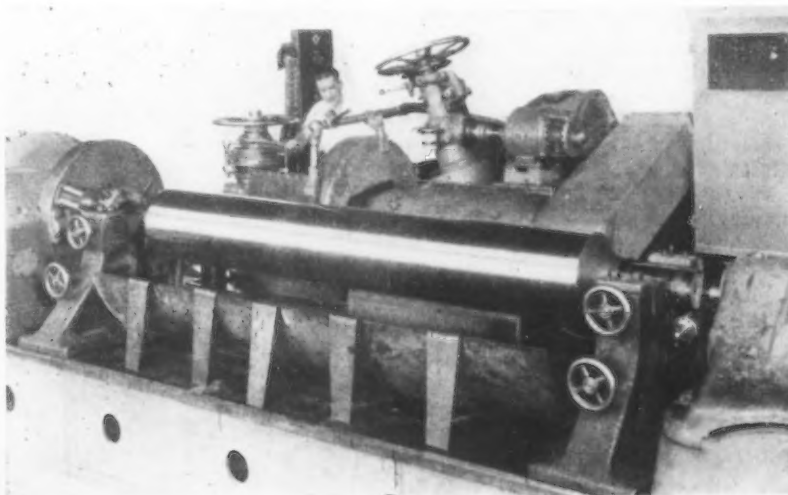
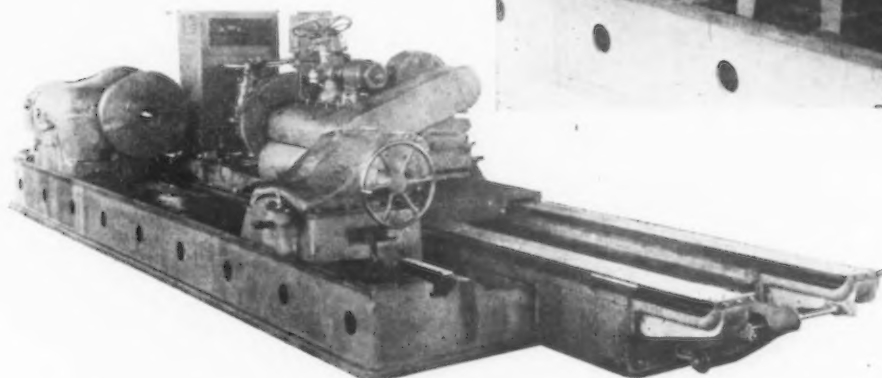
Arrangement of this new type 30-roll grinder may be seen in the illustrations. The front of the bed has a flat and an inverted-V chilled bearing surface which support the headstock, footstock and roll-carrying heads. The rear part carries the grinding wheel carriage with the grinding wheel head, crowning and concaving mechanism, traverse and reverse

range or to completely disengage the mechanism.

The grinding wheel head is equipped with Landis adjustable steel-

plied for lightweight rolls. The bearings, made of cast iron, are adjusted separately by handwheels at the front of the roll-head base. A bracket attached to the top of these heads carries a hardened grease block which is swung into contact with the roll neck during the grinding operation.

A single eccentric-type crowning and concaving mechanism of recent design driven from the traversing motor is used. The change-gear case



*FRONT view of the new Landis 48 x 168-in. roll grinder. The close-up view shows the position of the operator with all controls within reach and with clear view of contact between the wheel and work*

mechanism, operator's platform and water pump. The wheel carriage slides in a flat and an inverted-V guide, both chilled. Sheet metal covers keep foreign matter from the guides, which are lubricated by force feed, the same system also supplying lubrication for the traversing mechanism. Every precaution has been taken to assure maintaining clean oil in the system at all times.

The operator's platform is located to permit full view of the point of contact between the wheel and the work, and all controls, including electric, are within convenient reach. Power for traversing the wheel-carriage is supplied by a motor mounted on its top. This power is transmitted from the traversing mechanism by means of a large steel worm to a bronze gear mounted on the upper end of the drive shaft set at an angle to the guides. Another worm on the lower end of this shaft engages a heavy rack fastened to the bed. The various traversing speeds are secured almost entirely through a field rheostat, and reversal is accomplished electrically by means of a reversing controller brought into play by the reversing dogs. A control quadrant is provided to give either a high speed range or a low speed

backed babbitt bearings, which, with the thrust bearing, are lubricated continuously. The 36-in. grinding wheel is carried by a heat-treated alloy steel spindle and is driven from the right-hand end by multiple-V belts. The wheel-drive motor is mounted on top of the base. The grinding wheel feed is through a long screw and bronze half-nut. Rapid electric wheel-head cross movement is also provided. A motor with reversing drum controller and dynamic braking arrangement is mounted close to the feed up arm, the necessary control being just below the feed-up hand-wheel.

The headstock is equipped with a large diameter live spindle driven through herringbone gears from an adjustable-speed motor. Force feed lubrication is employed. An equalizing drive, with the roll driven from opposite sides with equal pressure, is supplied. This drive engages the roll itself or a driving dog. For different sizes of rolls different dogs can be furnished. The footstock is adjustable along the entire length bed; for maintaining alinement it is provided with a cross adjustment.

Roll-carrying heads of the two-bearing type are usually furnished, but three-bearing heads can be sup-

plied with removable cover is located on the operator's platform. The crowning and concaving mechanism is located at the rear of the machine, immediately below the wheel-head; its roller is carried by means of an adjustable slide that has a graduated scale to facilitate making settings, one setting to another. The wheel-truing fixture is mounted on the rear of the footstock. The water pump, of impeller type, is attached to the rear of the wheel carriage. The lower end of the pump is immersed in a reservoir which is as long as the maximum travel of the carriage.

The machine is made in swings of 36, 48 or 60 in. and in lengths ranging from 10 to 24 ft., in increments of 2 ft. Longer machines are built special.

### Allied Die-Caster

A monthly publication, running 12 pages and issued by the Allied Die Casting Corporation, Long Island City, N. Y., is devoted to the making and use of die castings in the multitudinous forms in which they have made their way into industry. Both plain castings and castings with inserts are treated in brief articles in the successive monthly issues.



## Automatic Duplex Milling Machine with Disappearing Spindles

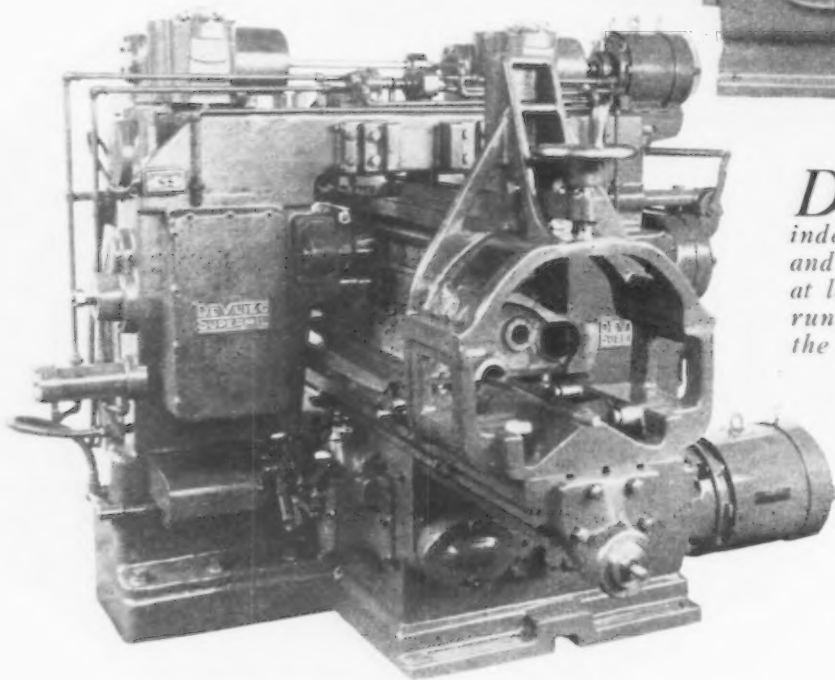
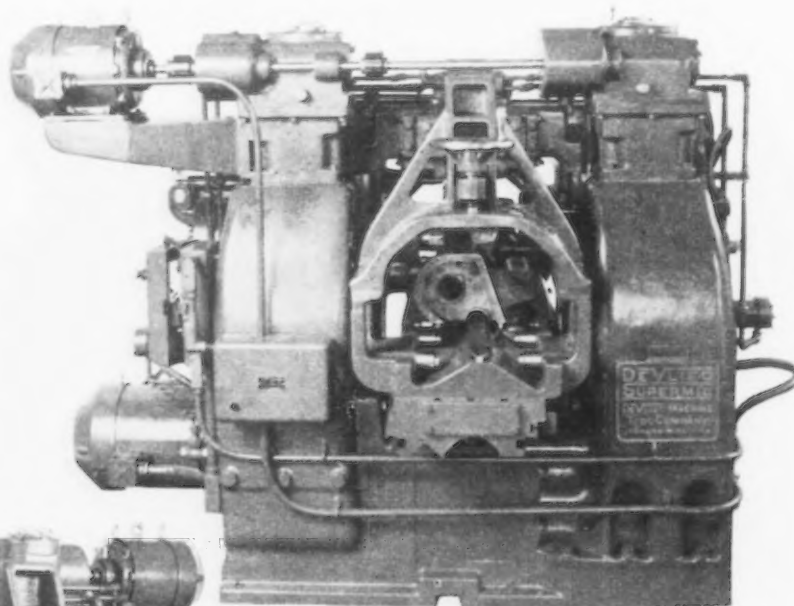
**T**HE automatic duplex Supermil here pictured, built by the DeVlieg Machine Tool Co., Jackson, Mich., features multiple-spindle fixed and automatically disappearing spindles, automatic coordination of the vertical and table feeds to produce a U-shaped cycle, use of tunnel-type fixtures that, in connecting with the conveyor line, avoid the necessity of overhead handling equipment, and construction and speeds that adapt the machine for application of tungsten-carbide cutters.

The set-up illustrated is for machining a new eight-cylinder block that has the crankcase half and the bell ends cast integral. On this block, at the upper portion toward the cylinder head, there are two major pads with a continuous surface in the same plane. These are milled with the plain adjustable fixed-cutter spindles on each side. Below these plain surfaces there are a number of small pads and bosses on each side of the crankcase with projections cast integral;

cutter wear. The disappearing spindles are of boring bar type and their movement is controlled by hydraulic cylinders. In common with the standard DeVlieg Supermil, this machine has duplex columns, hardened and

cams, in turn, operate push rods controlling the forward and reverse positions of the oil valve. A separate push rod and control is required for each disappearing spindle.

Operation of the machine is as follows: With the table in its extreme position, against the conveyor, the cylinder block is rolled against an approximate locator. Operation of a single lever drops the rolls, allowing the block to rest on hardened plates; simultaneously locating plugs are registered in the two holes in the block.



**D**EVFLIEG automatic duplex Supermil set up for an eight cylinder block with the crankcase half and bell ends cast integral. The view at left shows the machine with table run out for starting the cycle, while the rear view above shows the table position at finish of cycle

the latter interrupt the path of the cutter and necessitate use of the automatically disappearing spindles. On one side of the crankcase there is a second row of bosses behind the center interfering projection, these bosses being at a different height from those machined in the first half of the cycle.

Machining of all these surfaces is controlled automatically. With tungsten-carbide cutters run at a speed of 300 ft. per min., 25 in. per min. feed, production at the rate of 25 eight-cylinder blocks has been attained.

The fixed spindles are of the usual quill mounting with adjustment for

ground, steel table ways of vee and flat construction, and a standard feed mechanism, using the regular hardened and ground feed screw for the longitudinal movement of table. For the vertical movement an individual motor-driven pair of feed units is provided, each of these units having a hardened and ground screw. The vertical feed motor is direct connected and the raising and lowering are controlled through a reversing switch.

Controls for the hydraulic cylinders that actuate the disappearing spindles are operated by cams mounted on the top rail of the fixture. These

Clamping is accomplished through handwheels at each end of the upper part of the fixture, but air clamps operated from one end only can be substituted.

With the block in position, one of the feed levers is engaged, starting the vertical movement motor, feeding both heads down to the lower position, after which the table feed is automatically engaged, milling longitudinally.

At the completion of the longitudinal portion of the cycle, the table feed trips out and starts the vertical motor automatically, lifting the heads to the upper position and completing the milling cycle. The clamps are then released, the locating plugs dropped simultaneously and, with the raising of the rolls by the one lever, the block is slid on, the table in this extremity meeting the conveyor on the opposite side. Power rapid traverse is then engaged, returning table to the starting position.



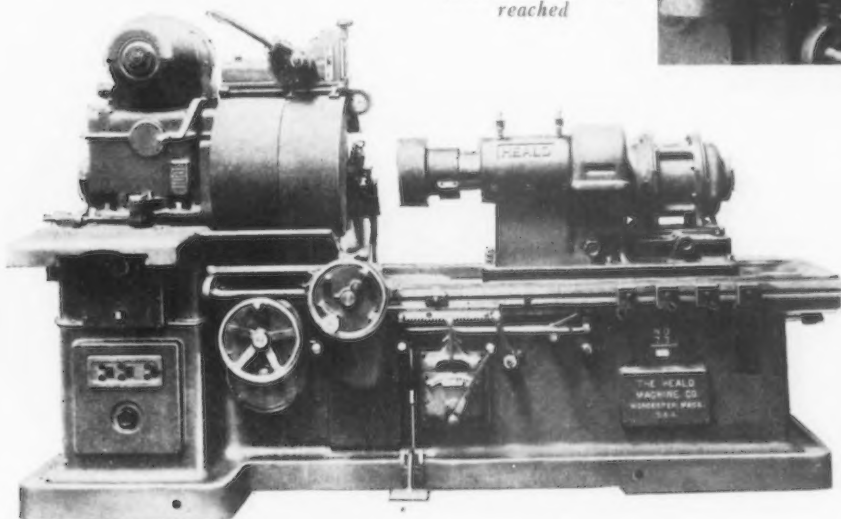
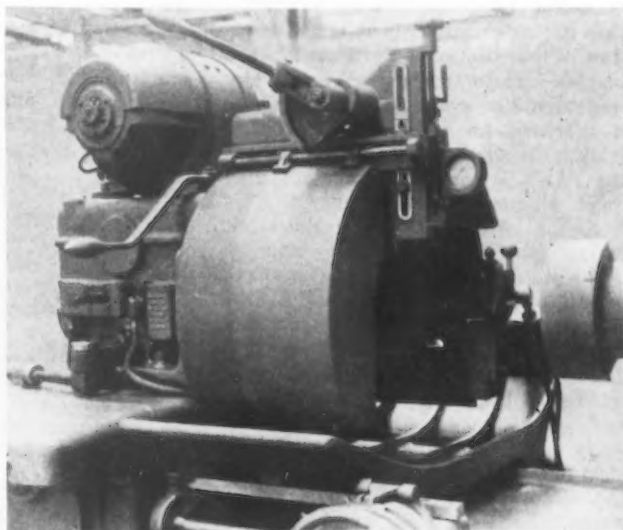
## Massive Internal Grinder Hogs and Finishes Large Pieces

**A** CHUCKING internal grinder for rapidly "hogging" out metal from large gears, bearing races, rolls, pipe, sheaves and similar pieces and then finishing the pieces to close limits has been brought out by the Heald Machine Co., Worcester, Mass. Weighing more than 9 tons, this massive machine is more than twice the size of any tool built by the company heretofore. It will grind straight or taper bores with equal facility, and face-grind without change of set-up.

The machine is self-contained and is of unit design, with each unit readily accessible. Three motors totaling 31 hp. are provided for driving the machine. These are: a 25-hp. motor for the wheelhead; a 3-hp. adjustable-speed motor for the workhead; and a 3-hp. motor for the hydraulic pump. When a coolant sys-

tem is furnished, an additional 3-hp. motor is provided. 21 in. in diameter can be ground; the smallest diameter ground is 15 in. The maximum length of bore is

*DESIGNED for large work, this new Heald internal grinder, weighs more than 9 tons. A 25-hp. motor is employed to drive the wheel alone. The close-up view of the workhead shows the dial indicator which tells when the hole is finished and permits truing the wheel at any predetermined point before the finished size is reached*



tem is furnished, an additional 3-hp. motor is provided.

Anti-friction bearings are used throughout, and pressure lubrication of all sliding ways is a feature.

Hydraulic operation of the table provides a smooth and instantly controlled drive at innumerable speeds ranging from 0 to 25 ft. per min. The sliding table with the wheelhead and its driving motor, the combined weight of which is 3300 lb., may be reversed at maximum speed without vibration—a feature cited as illustrating the power and flexibility of the hydraulic system employed.

All controls are concentrated at the front of the machine, the operator being able to govern the starting and braking of the workhead, the feed and reversal of the table, the cross feed, the dial indicator, the diamond, and the motor control panel without moving from his normal working position.

Using a 12-in. wheel, bores up to

15 in. The swing over the table is 35 in. and inside the standard water guard, 21 in.

### Base Weighs More Than 4 Tons

The base, an important unit in this class of equipment, is a one-piece, box-type, ribbed casting that weighs 4 tons. It is made of iron having a 20 per cent steel content. The ways, one V and one flat, that support the sliding table extend the full length of the base. Integral with the base, and adding to the weight and rigidity, is the oil reservoir for the hydraulic system. The reverse box and valves of the hydraulic system constitute a complete unit, located at the front of the machine. Except for these and the cylinder and piston attached to the under side of the table, the entire system is on the outside of the rear wall of the base, where it is entirely inclosed by removable guards. The pump is of gear type.

Automatic reversal of the table is controlled by three adjustable dogs, two of which provide any length movement up to a maximum of 36 in. The third allows the table to withdraw sufficiently so that the wheel can pass the diamond during the truing operation. A hand lever and foot treadle working in conjunction with this dog permits the table to withdraw when it is desired to true

the wheel, measure the work, or have the table go to rest position.

Hand reversal of the table can be accomplished at any point in its travel. Hand longitudinal feed for the table is by handwheel through rack and pinion. A lever at the right of this handwheel controls a by-pass valve which temporarily cuts out the hydraulic mechanism, permitting manual advance and return of the table for face grinding, as well as aiding in setting up the machine.

The wheelhead unit is of rigid design. The wheelhead and driving motor form a single unit, inasmuch as the spindle bracket, motor platform and lower half of the belt guard are cast in one piece. The spindle is mounted in two precision type anti-friction bearings carried in a cradle that is cast integral with the spindle bracket. Lubrication is by sight-feed oilers. A wheel guard covers the wheel at all times. The 25-hp. motor is adjustable transversely on its platform by a star wheel and screw to compensate for stretch of the 7-in. driving belt, the only belt used on the machine. An adjustable spring idler maintains correct belt tension.

The workhead is mounted on a cross-slide at the T-end of the machine and is clamped in position by six bolts. The head can be swivelled 22½ deg. on a large stud by means of a precision swiveling device, the amount of swivel being indicated by a graduated scale. The hardened and ground workhead spindle is mounted on two large anti-friction bearings and is driven by a hardened and ground worm and bronze worm gear which runs in a bath of oil. The

spindle bearings are readily adjusted from the front.

Workhead spindle speeds ranging from 35 to 140 r.p.m. are obtainable through the adjustable speed motor mounted on the spindle housing cover. The large work guard that incloses the fixture is of such design that it does not interfere with loading or unloading of the work.

A dial indicator that enables the operator to follow changes of size by direct readings can be provided. This indicator not only tells the operator when the hole is finished, but enables him to true the wheel at any predetermined point before finish size is reached, an important factor in holding to close limits or obtaining fine finish. The sizing control unit has a diamond pointed finger that is in contact with the hole of the work during grinding but can be swung out of the way to permit removal and reloading of the work. The position of this sizing unit can be adjusted for various diameters and lengths of hole.

A swinging diamond or wheel truing device that is hydraulically operated is a feature. This device is easily positioned and may be swung back out of the way when grinding. The diamond is rigidly held when truing the wheel; it trues at the same point at which the wheel grinds, and it is presented to the wheel at 90 deg. to its axis and parallel to the ways of the main table, thus assuring square truing. The diamond is swung into truing position and back to rest position by a handle which controls the valve governing the flow of oil to the diamond cylinder. A dog on the table automatically trips the valve and returns the diamond to rest position if the operator fails to do it manually. A ball handle on the diamond unit provides for swinging the diamond by hand if desired.

#### Work Is Fed to the Wheel

The feeding principle of the No. 77 machine is entirely different from other Heald internal grinders in that the work is fed to the wheel instead of the wheel being fed into the work. This is accomplished by mounting the workhead on a cross-slide carriage which slides in dovetailed ways on a massive bridge at the T-end of the base. Movement of the cross-slide is obtained through a fixed nut and a large diameter screw equipped with ball thrust bearings. Any feed from 0.00014 to 0.0011 in. per stroke table is obtainable. A coarse feed can be set for rough grinding to a predetermined limit, at which point the roughing feed automatically changes to a finishing feed.

All electrical control equipment is contained within the floor space limits of the machine. The central switch panel and workhead motor rheostat being located in a recess in the T-end of the base are out of the way and yet convenient to the operator.

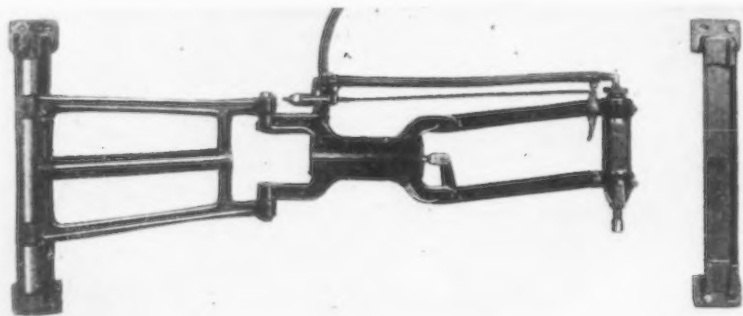
Floor space of 78 x 123 in. is occupied by the machine.

## Riveting Hammer Adapted for Wide Variety of Assembling Operations

**H**IGH-SPEED operation and flexibility feature the Airflex line of riveting hammers recently introduced by the Walcott Machine Co., Jackson, Mich. This tool has a wide variety of application in assembling operations; it may be employed for riveting, caulking, chiseling, flattening, peening, clinching, etc., and by using air rotors and electric drills in conjunction with the flexible bracket, drilling and ream-

ing device slips into a bracket, several of which may be mounted on the walls or post in various departments and the tool carried and mounted in them when their use is desired in other parts of the plant.

Three sizes and two models—wall and pedestal—of the Airflex hammer are made. Both models employ the same type of bracket. The smallest machine is for rivets up to 5/32 in.



*The holding device together with sensitive power-feed control adapts this riveting hammer for a wide range, including very light work*

ing, tapping, polishing, grinding, screw driving, and nut setting can be done.

An outstanding feature is the patented bracket device which holds the hammer steady at all times and provides a considerable working radius. When attached to a wall, this device permits bringing the tool to any point inside a half circle having a radius of 42 in. When mounted on the pedestal holder or on a post, the working range is increased to a three-quarter circle of the same radius. By adding elbow brackets, this radius can be extended farther. Furthermore, the parallel arms of the holding device permit vertical adjustment of about 4 in. The bracket column allows vertical movement of 6½ in., while on the pedestal models the entire bracket can be moved from top to bottom, a distance of 27 in.

The speed and power of the hammer are regulated by a patented throttle control valve, by means of which the blow can be varied from a slight vibration to a force of 4000 blows a minute. The steadiness of operation and the sensitiveness of control are featured as adapting the tool for light work, making possible the riveting of materials as fragile as glass without injury to the work or distortion of the rivet. The delicate speed and power control are expected to markedly affect assembling methods, permitting the use of rivets where screws or bolts could not be used because riveting hammers would break the piece, bend the rivets or throw the heads off center.

The tool is portable in that the hold-

ing device slips into a bracket, several of which may be mounted on the walls or post in various departments and the tool carried and mounted in them when their use is desired in other parts of the plant.

#### Demonstrates New Large Planer

**T**HE first of a new line of large planers was demonstrated by the G. A. Gray Co. at its plant in Cincinnati Oct. 20 and 21. The planer measures 12 ft. between the housings, 10 ft. under the rail and can plane work 30 ft. long. It weighs approximately half a million pounds. The company also showed its line of Maximum Service planers using tungsten-carbide tools at cutting speeds ranging from 100 to 150 ft. a minute. The exhibit was in charge of August Marx, vice-president and general manager.

H. A. Brassert & Co., 310 South Michigan Avenue, Chicago, announce receipt of the following orders: Bethlehem Steel Co., three 24 x 100 ft. hot blast stove linings for the Johnstown, Pa., plant; four 22 x 100 ft. hot blast stove linings for the Sparrows Point, Md., plant; graduated filler brick inserts for the stoves of the No. 4 blast furnace of Inland Steel Co., Chicago.



# Building and Automobile Prospects

BY LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

**T**WO of the chief key industries—automobile manufacturing and building—showed small gains in September, allowing for the usual seasonal variations. While these gains are not conclusive, either as to the beginning of a sustained advance in these particular industries or as to a turn in the general business cycle, they are encouraging.

That such upturns do not necessarily indicate a turn is obvious, since the temporary upturns that occurred in building last January and again in July did not prevent further recessions. Nor did similar upturns in automobile production in June, 1929, and April, 1930. But it is equally obvious that these gains do break the rate of decline and indicate a less heavy and persistent pressure to curtail industrial activity.

Their significance is increased by the fact that (1) both indexes are already at very low levels (building activity, for example, having been below average for over a year and still being but little above the lowest point since 1921), and (2) there is good reason to believe that automobile production is now quite closely adjusted to demand. If the latter point is true, it is logical to infer that the decline in the motor trade has been checked.

## Building Apparently Scraping Bottom

**P**ROBABLY the building curve is much more significant. The whole course of this curve since November, 1921, has suggested that the recession in building has been flattening out and approaching bottom. Remembering that seasonal variation has been eliminated, we can say that building activity was only a trifle lower in September than it was last January.

This point is considerably reinforced by the fact that the time is now close at hand when, according to certain factors which usually affect building operations, an upturn might be expected. We refer particularly to the tendency of building to respond, in time, to changes in money rates. It is now about a year since the market for commercial paper began the sharp decline which has carried it to present low levels. While past over-building

may delay the turn somewhat, the force of low interest rates should now begin to operate.

The building figures referred to are contracts awarded (floor space). Our adjusted index for September, 66.8 per cent of the average for 1921-1927, compares with 61.3 per cent in August, which is the lowest point reached since the middle of 1921.

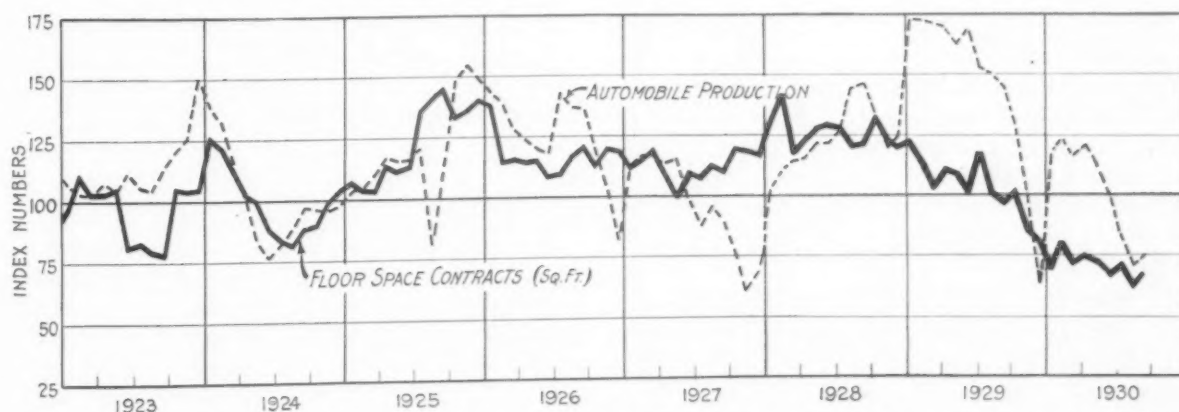
Further confirmation of improvement in the building outlook is given by the permit statistics. Building permits in September were still very low, but they made a distinct upturn, and continue to give the impression that the general trend has been slightly upward since last March. Rather frequently the trend of permits anticipates the construction contracts awarded.

Another straw in the wind is the recent action of real estate transfers. In September, such transfers in representative cities decreased less than usual for the season. They were only 66.8 per cent of the average for 1926 and probably were the fewest since 1921, but an adjusted index indicates improvement as compared with August.

## Automobile Recovery Faces Delay

**D**ESPITE the fact that our adjusted automobile index in September was 75.4 per cent of the average for 1921-1927, against 71.6 per cent in August, the automobile situation is less certain. October trade reports suggest a more than seasonal recession. Moreover, the automobile production curve has not yet fallen so low as the building curve, and we note that recessions in the motor industry are usually not complete when this is the case.

It seems probable, in view of the decline in sales reported by General Motors and the extremely backward business of several manufacturers, that the bottom of the recession in the motor trade has not yet been seen, and that a new low level will be reached before the end of the year. It is entirely clear that an unusually long period of readjustment will be required, and it seems probable that it will be another year before the industry can return to normal.



Considered as steel consumers, these two industries appear as offsetting factors. The prospects for continued fair-to-good demand for structural steel seem bright, while demand from the motor trade will probably be backward for several months.



W. W. MACON  
Editor

# THE IRON AGE

A. I. FINDLEY  
Editor Emeritus

(ESTABLISHED 1855)

## Stability Needed to Revive Demand

THE semi-annual meetings of the American Iron and Steel Institute have always commanded wide attention because they bring into the spotlight the state of sentiment among leaders in our most basic industry. Those in financial or business circles who looked for forecasts of the precise time that an upturn in trade will occur were disappointed, but those who sought evidences of a broad grasp of existing problems and a determination to solve them were rewarded.

The closest thing to a prophecy of the type expected was the statement by James A. Farrell that a cessation of intemperate competition would insure a revival in the steel industry within 60 days. Latent business, which he estimates would support 70 to 75 per cent operations, has been held back by selling practices that have disregarded costs and wiped out profits.

The force of his observations is apparent to anyone familiar with the fundamental principle that price unsettlement discourages enterprise. In every depression, no matter what its severity, a certain amount of potential demand accumulates pending stabilization of markets. And postponement of buying is not confined to manufacturers and distributors—it extends to the ultimate consumer, whose purchases now determine the business volume of the automobile industry and other important customers of iron and steel producers.

Efforts to halt the downtrend of prices are, no doubt, conditioned, in part, by the world economic situation, but there is encouragement in Mr. Farrell's report, based on first-hand observation, that the seriousness of the depression in Europe has been exaggerated. On the other hand, political troubles in Brazil and India are admittedly as grave as they have been represented but, by threatening the flow of manganese ore to this country, introduce a cost uncertainty that should reinforce the determination of steel manufacturers to maintain their prices. Certainly all circumstances of the present situation point to the pressing need for market stability. With production low and earnings giving way to deficits, continued price cutting can only result in piling loss upon loss, stifling demand and accentuating depression.

NOT many concerns in the field of THE IRON AGE can safely do much in the way of building up stocks. Standard articles belong very largely to the consumer trade, and even then rapid changes in design and desire are against prolonged manufacture without orders. Nor can many take up the making of novelties, which seem to win a market regardless of the state of the times. The put-and-take top in 1921 took

hundreds of tons of hexagon brass and months of output of screw machines. Today we have the vogue of the Tom Thumb golf courses, with their aggregate large consumption of iron and steel products. Steel breast plates and metal shin guards have not arrived in football nor steel bats in baseball, but the lesson is to put the market research department on what to do in novelties during the next recession.

## Adjust Man to the Machine

THE need for market stability received no more emphasis at the meeting of the American Iron and Steel Institute than the necessity for mitigating unemployment. Much has been done to reduce involuntary idleness by rotating work among a maximum number of men, but it was urged also that the steel industry do its part in caring for those for whom no jobs can be provided.

There is no longer any doubt that every effort will be made to prevent want and suffering arising out of the present period of cyclical unemployment. But, looking farther ahead, the industry is likewise giving careful attention to unemployment resulting from advances in productive efficiency.

Production has outdistanced the ability to consume, according to Myron C. Taylor and Nicholas Murray Butler, speakers at the institute banquet, and it is a social and political responsibility of first magnitude to remove that maladjustment. As Mr. Taylor well said, the solution of the problem is not to destroy the machine or to close the laboratory. No backward step is in order. It is the duty of industrial leaders to adjust the man to the machine. "It is up to us to make the adjustment at once."

## Why Not "Sell Now"?

PHILADELPHIA has started a "Buy Now" campaign, and so has Boston. No one can say that such efforts to lift the business depression will not prove of value. It would be difficult to prove to the contrary. They are a direct appeal to the retail trade, which of course has its effect on all lines of manufacturing.

It remains that, unless retail prices are accepted as virtually at bottom, the buying will be spasmodic, indiscriminate and truly ineffectual. Were there assuredly a state of total deflation, buying would need little impetus. Yet, perhaps belief in the reasonableness of present general price levels may be growing so rapidly that mass pressure will quicken the purchasing response. Heroic measures seem necessary to reverse today's exaggerated pessimism.

We agree that the time is for action. But we like

the idea of pressing to sell. We discussed the subject in this column two weeks ago. Buying has been heavily restricted. Thrift has been almost overdone. Needs and wants are accumulating. What must be done now is to stimulate latent desires. There are numbers who have the means or can arrange to satisfy their requirements. The present state of mind must be changed. Continued steady effort to sell is the key.

Paraphrasing slightly what Director Abbott of the American Institute of Steel Construction said at Pinehurst Tuesday, "there should be no complaint of under-consumption until as much time and money has been expended on trying to sell and develop the market as is spent on trying to increase output and lower costs."

The plans of President Hoover's unemployment committee to find work for the idle and the movement set on foot by a Chicago alderman to release a large volume of public work are examples of constructive alleviation of the most serious phases of the depression—the possibility of widespread human suffering.

If the status of unemployment and the attendant distress have not been exaggerated, exception must be removed to the buy-now injunction. A parallel campaign of "Buy Now" and "Sell Now" could well be substituted. Certainly concentration on selling would discover such weak spots as have resisted the deflation movement. Sustained business requires confidence in its equitable basis.

One deterrent to broad confidence is the view fairly widely held that those branches of labor, particularly the building trades, which procured large wage advances, cannot continue to remain out of line. The probable slowness of the return to normal will accentuate the fact. Current philanthropic enterprises do not arise from the needs of today so much as from those of tomorrow. The recession of 1921 was measurably much more severe than that of 1930, but then we had marked deficiencies in consumer needs that brought about a vigorous rebound and gave relatively little concern over unemployment. Today the hope is for the 40 per cent expansion that will bring us back to normal. Yet the fear persists that a renewed prosperity would be unstable so far as it represents a postponement of wage adjustments.

### Better Steel Tonnage Prospects

**I**T is no wonder the steel makers are looking for an early increase in their tonnage, for a great deal of demand has disappeared in the last few months, leaving little or no room for further losses except for some decreases in the last two months of the year of purely seasonal character.

Compare conditions now with those of six months ago, or on May 1. Then there was fairly heavy freight car building with very little new buying. The automobile industry was tapering off and in various other lines the outlook was for less demand. Steel production had been declining for two months and had lost about 10 per cent from its February rate, the peak rate of the year. It has since lost about one-third of its May 1 rate. The structural fabricating industry was still doing well but there were suspicions it was doing too well to last, that it was running partly on momentum. The farm implement industry was

very active but there were strong beliefs that it was producing too heavily.

Of late the condition has been quite different. Only two lines of steel consumption, fabricated structural steel and line pipe, have been at all active. Practically everything else has appeared to be very dull, and yet there has been quite a substantial volume of steel production. Per capita consumption of steel has been only a trifle below the highest rate before the war.

This points to a really large miscellaneous consumption of steel, so widespread that the activity cannot be noticed in detail. That is something there is no reason to suppose will decrease, for presumably if it were lined up for a decrease on account of industrial depression the decrease would have occurred already. Apparently it has room only for an increase.

For nine successive years, through thick and thin, so to speak, production of steel ingots has increased from December to January, increases being shown below.

*Ingot Production, January Over December*

	Per Cent		Per Cent
1922.....	16.0	1927.....	10.3
1923.....	7.7	1928.....	25.7
1924.....	18.0	1929.....	3.6
1925.....	13.1	1930.....	21.0
1926.....	4.1		

Steel in all its history has had such a way of transgressing rules that when it makes the consistent showing just noted there must be something in it. Years that had a poor ending and years that had a good ending were alike followed by January improvement, and the years with poor endings had the greater January increases following. The two largest January increases followed 1927 and 1929. Furthermore, in every case March production was above January with the exception of this year when the increase ran only into February. In 1923 and 1928 the increase extended into April while in 1929 it extended into May.

### Recovery from Excess Spending

**T**HE cry that people should spend more money, for the purpose of relieving depression is, of course, countered by arguing that the trouble is, they have spent too much already. Without taking sides on this question we may point out that there are two general classes of this spending. One is long-term investing in construction work of various sorts; the other is spending by individuals for dwelling houses and their contents. It takes longer with the former to liquidate the deferred payments than it does with the latter.

Savings are eventually translated into national wealth. Taking earlier reports of the "wealth" of the country by the Census Bureau, and the finding of the National Industrial Conference Board issued last February as to wealth in 1928, we have the following average annual increments: 1900 to 1912, 6.4 per cent; 1912 to 1922, 5.6 per cent; 1922 to 1928, 1.9 per cent.

Ascertainment of wealth may be subject to a large possible error, but these figures show such a remarkable divergence that there must be much in the showing. Despite the large increase in the dol-



lar value of things from 1912 to 1922, on account of the war, there was a smaller rate of increase than previously, while from 1922 to 1928 there was hardly any increase. The Bureau of Labor Statistics commodity index stood at the same level for 1928 as for 1922.

Nearly four years before the Conference Board finding was issued, there was much talk along this very line. Under the caption "Savings and Wealth" in *THE IRON AGE* of April 8, 1926, it was said: "The criticism of the past few years, that the people are doing too much installment buying, carries an inference that they are not saving as they used to do. If so, the wealth of the country is not increasing as it used to increase. . . . Herein lies an economic problem that seems to be quite new. . . . It would seem that, if there is much unsoundness in the present economic structure, it lies in the position of the people as individuals and not with the productive enterprises. Past experiences have not made such a condition familiar. Depressions in the past have been most commonly ascribed to overexpansion in productive capacity. Now the chief criticism has been that too much money has been going into unproductive things of short life."

Perhaps the best illustration of too much liquid capital being converted into fixed capital, which the country was not yet able to employ to the remuneration of the owners is furnished by the depression of

1873 to 1878, when tens of thousands of miles of railroad had been built, and numerous factories to equip them, along with various other things.

We are now engaged in liquidating or making up for recent excesses. If it is chiefly a matter of excesses in individual expenditures, rather than one of excesses in expenditures for more permanent things, there is an indication that we shall get through with the adjustment sooner than otherwise. In that observation there is much ground for hope. There may be a present excess of production and transportation facilities, but the statistics of increase in wealth by no means indicate that an inordinate amount of capital has been sunk of late. The increase in facilities has come largely through improved efficiency in operation.

VIRTUALLY every month brings a new higher figure for the unit output of the country's blast furnaces. On Oct. 1, there were 123 furnaces active, operating at a rate of 600 tons a furnace a day. Precisely six years ago, 50 more stacks were necessary for approximately the same total output. The 173 furnaces then averaged 418 tons each. The result follows of course more from improved operating methods and apparatus than from the enlargements and the few new large stacks that characterize the construction of recent years.

## CORRESPONDENCE

### Three-Day Weeks

*To the Editor:* I always look over the articles in the editorial page of *THE IRON AGE*, and find myself in general reading them with full approval. There is, however, a viewpoint which occasionally comes out in them and is fully expressed in "High Wages and Three-Day Weeks," in your issue of Oct. 16, with which I cannot at all agree.

Looking at the thing from the standpoint of the engineer, it is absolutely silly for the whole social machine to run on such a small margin of safety and with such a thin general prosperity as ours does.

Sir William, whom you are criticising, is fundamentally right as to the physical basis of prosperity. With our present supplies of raw material and our present machinery and methods of production, and with an improvement in our highly inefficient method of distribution, three days a week are enough to produce goods in such quantity that equitably distributing them would produce a general material prosperity we have not yet attained.

I can see but two things in the way of attaining this. First, there is the Malthusian argument which you bring out to the effect that distress is necessary to prevent overpopulation. The answer to this is simple. Birth control is supplanting Malthus. Birth control is practiced most largely by those in prosperous circumstances, less extensively by those nearer the margin of subsistence, and not at all by the submerged classes where disease and

other factors in the Malthusian system still hold full sway.

The other thing that stands in the way of high production and generous distribution of which we are physically capable seems to lie in the complexities and peculiarities of the monetary system; but if this is true, it is not an argument for non-action, but an argument for revising the monetary system itself. Perhaps the whole thing needs to be revised. It most certainly does if it is the one thing that stands in the way of realizing the enormous material potentialities latent in our industrial system.

The hopeful thing about the problem is that the interest of almost all classes of society is identical. It is important to manufacturer and worker alike that the buying power of the worker shall be greater. It is important to manufacturer and farmer alike that the hundreds of thousands of hard working but poorly rewarded families in the rural regions should be brought in some way into the chain of production and consumption; and that, of course, is not necessarily to be done by keeping them on the farms.

To put it briefly, it seems foolish to take it for granted that the limitations of any particular financial system under which we may happen to be working should be taken as a law of God. We should rather, like good engineers, be examining the mechanism and operations of that system to make it a more efficient device for manufacturing and distributing the riches with which we have been endowed.

I may say in conclusion that I have no remedy of my own. It is primarily a job for the economist and financier, and all the evidence would indicate that they have gone to sleep on it.

RALPH E. FLANDERS,  
Manager, Jones & Lamson Machine Co.  
Springfield, Vt.



# Scrap Prices and Steel Production Undergo Further Declines

SCRAP Quotations Now Close to 1921 Levels—Steel Plants on 50 Per Cent Basis—105,000 Tons of Rails Booked

WITH further declines reported in scrap prices and in ingot output, the immediate outlook in the iron and steel industry lacks promise. Reductions in old material prices have been general, affecting virtually all items listed, with heavy melting scrap, the key grade, off \$1 a ton at Philadelphia, 50c. at Detroit and 25c. at Pittsburgh and St. Louis. THE IRON AGE composite price for heavy melting steel, at \$12.25 a gross ton, is at the lowest level since 1921.

Steel ingot production, reflecting seasonal contraction in tin plate and pipe output and the absence of expected autumnal improvement in other lines, has receded to 50 per cent of capacity, compared with 53 per cent a week ago. But with structural steel demand holding up fairly well and with a moderate amount of railroad business developing, it is possible that the present rate of operations will prove the low for 1930, barring year-end curtailment.

Rail orders include 75,000 tons placed by the Baltimore & Ohio and 15,000 tons bought by the Chicago & North Western. The latter road also renewed 15,000 tons that had not been specified in its expiring contract. The Delaware, Lackawanna & Western, which recently closed for 2500 tons, will buy 16,000 tons additional, while the Board of Transportation, New York, has taken bids on 10,000 tons for subways. The Pennsylvania is considering the purchase of 250,000 tons, and the expected inquiry from the New York Central will probably call for 175,000 tons. Producers are being given considerable latitude in scheduling rollings and consequently will be in a position to use rail commitments to stabilize their raw steel output.

To obtain further tonnage to offset losses in business from other directions steel producers are pressing the railroads to place orders for cars and locomotives. It is said that such buying can be stimulated if arrangements can be made to finance contracts to their full amount. Normally, equipment trust certificates cover only 80 per cent of the purchase price, the remaining 20 per cent being paid in cash.

The Virginian Railway will rebuild 500 to 600 coal cars, requiring 6000 tons of steel, while the 2000 cars being constructed by the Baltimore & Ohio will call for 15,000 tons.

New structural steel projects, at 53,000 tons, are the largest since the first week of September. Awards are considerably above average, totaling 40,000 tons compared with 48,000 tons a week ago.

Steel business in the aggregate continues to show

the effects of the policy of extreme caution now prevalent among all buyers. The statement of James A. Farrell before the American Iron and Steel Institute that there is sufficient latent business to support 70 to 75 per cent steel production is probably not greatly overdrawn, considering how quickly the nascent expansion in demand was checked in September and pronounced conservatism again set in. Price unsettlement discourages industrial enterprise as well as the purchase of consumer goods, a fact that is only too evident in the automobile industry, one of the major users of iron and steel.

Iron and steel prices are still sensitive, although demand is exceedingly sluggish. Pig iron shipments, which showed signs of expanding earlier in the month, are again falling off. Orders for finished steel are of the hand-to-mouth variety. Actual changes in steel prices during the week are few. Galvanized sheets and wire nails are off \$1 a ton, and concessions are reported on plain wire.

Steadily shrinking earnings of steel companies, in some instances reaching the vanishing point, are counted on to result in a firmer price stand. The Steel Corporation's earnings, which are considerably above the average, were \$2.06 per common share in the third quarter, compared with \$3.01 in the second quarter and \$3.44 in the first. Total earnings for the nine months, at \$134,672,000, exceeded those for the comparable periods in the last two recession years, although prices this year, as measured by THE IRON AGE steel composite, were 6 per cent lower than in 1927 and 15 per cent lower than in 1924.

Among the few outlets for iron and steel that are showing seasonal improvement are the radio, washing machine and stove industries. Two Eastern radio makers have stepped up output to 7500 and 6500 sets a day respectively, while a third continues to make 2000 sets.

Iron and steel exports in September, at 131,211 tons, were 20,000 tons smaller than in August. More than half of the decline was accounted for by scrap exports, which receded 11,000 tons. Machinery exports in September, at \$33,829,000, were the smallest for any month in two years.

The European Steel Cartel has been prolonged until the end of the year.

Copper has declined to 9½c., Connecticut valley, another new low price.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.135c. a lb. and \$16.29 a ton respectively.

# PITTSBURGH

## Scrap Declines Further as Steel Orders and Operations Fail to Gain

PITTSBURGH, Oct. 28.—With the downward trend in specifications for finished steel products temporarily checked, the volume of tonnage coming to Pittsburgh mills is fairly well maintained. Ingot production is still declining slightly, but recent losses have been in the form of adjustments to the requirements of finishing mills, and the present rate of approximately 50 per cent of theoretical capacity seems likely to represent the low point of the year, with the possible exception of temporary year-end curtailment.

The worst feature of October business has been the decline in pipe and tin plate production, which was entirely seasonable and had been generally expected in the trade. However, autumnal improvement in other lines did not materialize and the industry was forced to adjust itself to the loss of tonnage represented by the products concerned.

Continued activity in the structural market has helped greatly to maintain operations in the Pittsburgh district, and the prospect of considerable buying by the railroads in the next month is the most favorable feature of the present market. The 2000 cars to be built by the Baltimore & Ohio will require about 15,000 tons of steel, and car building by the Virginian Railway will take an additional 6000 tons. The rail order of the Baltimore & Ohio amounts to 75,000 tons.

Conditions among other steel consumer groups have not changed materially in the last week. Heavier releases by one or two automobile companies which are soon to bring out new models are offset by declines among other makers. Farm implement manufacturers served by Pittsburgh mills are far behind their usual season for production of next year's requirements. Barge builders are still sparsely occupied, but the prospect of heavy orders by the Government in the next few months has encouraged local makers in the last week.

Prices reflect the weakness provoked by the eagerness of some mills for business. Other mills show a disposition to meet current conditions in spite of recent efforts to raise price levels. Wire nails have declined \$1 a ton to \$1.95 a keg, Pittsburgh, and manufacturers' wire has been subject to additional shading. Galvanized sheets are no longer quoted at more than 3c., Pittsburgh, and concessions of \$1 a ton to the trade and \$2 to jobbers are not uncommon.

The scrap market has again declined throughout the list as a result of the failure of mills to place orders. Heavy melting steel at Pittsburgh is approaching the lowest levels since 1921

Downward trend in steel specifications believed to have been checked.

\* \* \*

Ingot production rate for the district is scarcely more than 50 per cent of capacity.

\* \* \*

Prospect of railroad buying is the most favorable feature of the market.

\* \* \*

Heavier releases by one or two automobile makers offset by declines among other makers' requirements.

\* \* \*

Scrap declines further. Heavy melting steel at lowest level in a decade.

and the market still is tending downward.

### Ferroalloys

Shipments this month have fallen below those of September, reflecting the low rate of steel ingot operations in the district. Consumers are not yet showing interest in future requirements, and spot sales are uniformly in small lots.

### Semi-Finished Steel

Shipments to the smaller non-integrated sheet and strip mills in the Valleys and the Pittsburgh district this month are lighter than they were last, and scarcely any new buying is reported. As old contracts run out most users are able to extend them, and if any price adjustment is made it is not reported in the open market. Scarcely any spot buying of billets or sheet bars is being done, although there are occasional sales of forging billets at \$36, Pittsburgh. Wire rods are quiet, and prices in line with a \$36, Pittsburgh, basis are generally quoted.

### Pig Iron

Total shipments of some of the merchant furnaces in this district have increased in the last half of the month, but part of this improvement is attributed to the higher requirements of one or two non-integrated steel companies. The month as a whole will show a gain over September in aggregate pig iron shipments, but has reflected no change in the character of buying. Small-lot purchases predominate, and consumers have shown no more interest than usual in forward commitments.

The price situation has shown little change, and quotations are none too

strong. One maker of malleable iron in the Valley is reported to be soliciting business under the current quotation, but sales which have been made at such figures represent stock liquidation transactions and are hardly representative of the general market. The price of foundry iron is also subject to shading in the Pittsburgh district, but sellers are not particularly interested, and the market is nominally unchanged at recent figures. No tonnage has come out to test the basic iron price of \$17, Valley, and \$17.50, Pittsburgh district furnace.

Prices per gross ton, f.o.b. Valley furnace:

Basic .....	\$17.00
Bessemer .....	17.50
Gray forge .....	16.50
No. 2 foundry .....	17.00
No. 3 foundry .....	16.50
Malleable .....	17.50
Low phos., copper free .....	\$26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic .....	\$17.50
No. 2 foundry .....	17.50
No. 3 foundry .....	17.00
Malleable .....	18.00
Bessemer .....	18.00

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

### Bars, Plates and Shapes

With the structural market less active than it has been in recent weeks, interest is centered on railroad business, which looms rather large, particularly as compared with recent activity. Approximately 15,000 tons of plates and shapes will be required for 2000 freight cars for the Baltimore & Ohio. While the type of gondola car has not been definitely decided upon, plans are being made and inquiry for the steel will be out shortly. The bodies for 1000 box cars are to be built by the Standard Steel Car Co. The Virginian Railway is inquiring for 500 to 600 coal cars, which will take approximately 6000 tons of plates. No other car business is immediately pending.

The barge market is also quiet, although reports of large purchases by the Government are heard from time to time. An experimental welded barge, being built by a Pittsburgh district yard, is nearing completion, and its success may bring large orders from the Inland Waterways Corporation in the next few months. Independent companies are also mentioned as prospective buyers, but no new inquiry has come out. The general contract on the new Federal Reserve Bank Building in Pittsburgh has been let, but the steel fabrication is still pending. Other large jobs reported recently are active, but no awards have been made in the last week. Bars are still very quiet, although some business in reinforcing steel is



# A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,  
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Oct. 28, 1930	Oct. 21, 1930	Sept. 30, 1930	Oct. 29, 1929
No. 2 fdy., Philadelphia.....	\$18.76	\$18.76	\$18.76	\$21.26
No. 2, Valley furnace.....	17.00	17.00	17.50	18.50
No. 2 Southern, Cin'ti.....	15.19	15.19	15.19	17.69
No. 2, Birmingham.....	14.00	14.00	14.00	14.50
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	20.00
Basic, del'd eastern Pa.....	17.75	17.75	17.75	19.75
Basic, Valley furnace.....	17.00	17.00	17.00	18.50
Valley Bessemer, del'd P'gh..	19.26	19.26	19.76	20.76
Malleable, Chicago*.....	17.50	17.50	17.50	20.00
Malleable, Valley.....	17.50	17.50	18.00	19.00
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace....	94.00	94.00	94.00	105.00

Rails, Billets, Etc., Per Gross Ton:	Oct. 28, 1930	Oct. 21, 1930	Sept. 30, 1930	Oct. 29, 1929
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh..	31.00	31.00	31.00	35.00
Sheet bars, Pittsburgh.....	31.00	31.00	31.00	35.00
Slabs, Pittsburgh.....	31.00	31.00	31.00	35.00
Forging billets, Pittsburgh....	36.00	36.00	36.00	40.00
Wire rods, Pittsburgh.....	36.00	36.00	36.00	40.00
<b>Cents</b>				
Skelp, grvd. steel, P'gh, lb...	1.60	1.60	1.70	1.85

Finished Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.60	1.60	1.65	1.90
Bars, Chicago.....	1.70	1.70	1.70	2.00
Bars, Cleveland.....	1.65	1.65	1.65	1.90
Bars, New York.....	1.93	1.93	1.98	2.24
Tank plates, Pittsburgh.....	1.60	1.60	1.60	1.90
Tank plates, Chicago.....	1.70	1.70	1.70	2.05
Tank plates, New York.....	1.88	1.88	1.88	2.22½
Structural shapes, Pittsburgh..	1.60	1.60	1.60	1.90
Structural shapes, Chicago..	1.70	1.70	1.70	2.00
Structural shapes, New York...	1.85½	1.85½	1.85½	2.14½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.30
Hot-rolled strips, Pittsburgh..	1.60	1.60	1.65	1.90
Cold-rolled strips, Pittsburgh..	2.35	2.35	2.35	2.75

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel, Per Lb. to Large Buyers:	Oct. 28, 1930	Oct. 21, 1930	Sept. 30, 1930	Oct. 29, 1929
Sheets, black, No. 24, P'gh...	2.35	2.35	2.45	2.75
Sheets, black, No. 24, Chicago	2.45	2.55	2.55	2.95
dist. mill.....	2.95	3.00	3.00	3.50
Sheets, galv., No. 24, P'gh...	3.10	3.10	3.10	3.60
dist. mill.....	2.05	2.05	2.15	2.35
Sheets, blue, No. 13, P'gh...	2.25	2.25	2.25	2.45
dist. mill.....	1.95	2.00	2.00	2.40
Wire nails, Pittsburgh.....	2.05	2.05	2.10	2.45
Wire nails, Chicago dist. mill..	2.30	2.30	2.30	2.40
Plain wire, Pittsburgh.....	2.35	2.35	2.35	2.40
Barbed wire, galv., Pittsburgh	2.60	2.70	2.70	3.05
Barbed wire, galv., Chicago	2.75	2.85	2.85	3.15
dist. mill.....	\$5.00	\$5.00	\$5.25	\$5.35
Tin plate, 100 lb. box, P'gh.				

Old Material, Per Gross Ton:	Oct. 28, 1930	Oct. 21, 1930	Sept. 30, 1930	Oct. 29, 1929
Heavy melting steel, P'gh....	\$14.25	\$14.50	\$15.25	\$17.25
Heavy melting steel, Phila....	11.50	12.50	13.00	15.50
Heavy melting steel, Ch'go....	11.00	11.00	12.50	14.00
Carwheels, Chicago.....	12.50	13.00	13.50	14.00
Carwheels, Philadelphia.....	15.00	15.00	15.00	16.50
No. 1 cast, Pittsburgh.....	12.75	13.25	13.50	15.50
No. 1 cast, Philadelphia.....	13.00	13.00	13.00	16.00
No. 1 cast, Ch'go (net ton)...	10.00	10.50	11.00	14.50
No. 1 RR. wrot., Phila.....	14.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)	9.00	9.25	10.00	14.00

Coke, Connellsville, Per Net Ton at Oven:	Oct. 28, 1930	Oct. 21, 1930	Sept. 30, 1930	Oct. 29, 1929
Furnace coke, prompt.....	\$2.60	\$2.60	\$2.60	\$2.65
Foundry coke, prompt.....	3.50	3.50	3.50	3.75

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	9.62½	10.12½	10.12½	18.12½
Electrolytic copper, refinery..	9.25	9.75	9.75	17.75
Tin (Straits), New York.....	27.12½	27.12½	28.75	40.75
Zinc, East St. Louis.....	3.95	4.00	4.25	6.60
Zinc, New York.....	4.30	4.35	4.60	6.95
Lead, St. Louis.....	4.95	4.95	5.35	6.55
Lead, New York.....	5.10	5.10	5.50	6.75
Antimony (Asiatic), N. Y....	7.37½	7.37½	7.50	8.75

still coming out. A freight building for the Pennsylvania Railroad at Erie, Pa., taking 600 tons, has been let to the Concrete Steel Co.

Prices are unchanged, with the market on plates and shapes nominally quoted at 1.60c., Pittsburgh, and on bars at 1.60c. to 1.65c. Reports of sharp concessions on desirable tonnages of plates and shapes are common, but the situation does not seem to warrant any adjustment of quoted prices.

## Tubular Goods

With line pipe buying for the present year apparently at an end, retrenchment continues in the pipe industry. Specifications for standard building pipe have failed to show much seasonal improvement this fall, and the oil industry is buying at no better rate than it has for several months. Lapweld and seamless pipe production in the Pittsburgh and Youngstown districts is declining, but considerable activity continues in the electric-weld mills. These units are running at a considerably better rate than any of the other departments, and are likely to be engaged until the end of the year on present orders.

## Wire Products

Shipments of manufacturers' wire this month are holding at about the rate that prevailed during September, and local makers look for no further curtailment this year. Present business is sufficient for operations of 40 to 50 per cent of capacity, which is fairly representative of the industry at this time. On merchant wire products prices are again rather weak in sympathy with nails. The \$2, Pittsburgh, quotation on nails now applies to almost any one in the trade, and jobbers are generally buying at \$1 to \$2 a ton less. Mills continue to quote \$2 on such business, but quotations of \$1.95 have been made to jobber buyers and the market lacks strength.

## Sheets

No change in the character of sheet specifications during the last week is reported, and mill operations are holding at about 45 per cent of capacity. Some makers in the Valleys have benefited by increased orders from the automobile industry, but the impetus is by no means general and will do little to improve the general status of the industry. Other sheet consum-

ers are continuing their specifications at about the rate which has prevailed in the last few weeks, but seasonal curtailment is in prospect for some of them and unless other users increase their tonnage further curtailment in production would not be unexpected in the sheet industry during the last two months of the year.

Prices continue weak. The larger mills, which had been reluctant to meet recent minimum prices, are gradually being forced to protect their positions. The market on galvanized sheets has settled rather generally to 3c., Pittsburgh, with jobbers enjoying the usual differential in many cases and the lower end of the range of 2.35c. to 2.45c. on black sheets is being extended to more buyers who have comparatively small tonnages to place. Light plates continue at 1.90c. to 2c., Pittsburgh, and blue annealed sheets at 2.05c. to 2.15c. No changes are reported on the other finishes.

## Tin Plate

Seasonal curtailment in the tin plate industry is still in progress, with operations this week standing between 50 and 55 per cent of capacity. Specifications are light and buyers are



## THE IRON AGE COMPOSITE PRICES

Finished Steel				Pig Iron		Steel Scrap	
2.135c. a Lb.				\$16.29 a Gross Ton		\$12.25 a Gross Ton	
Oct. 28, 1930			2.135c.		16.29		12.67
One week ago			2.156c.		16.38		13.58
One month ago			2.362c.		18.38		15.58
One year ago							
Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.				Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.		Based on heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.	
High		Low		High		Low	
1930.....	2.362c., Jan. 7:	2.135c., Oct. 14		\$18.21, Jan. 7:	\$16.29, Oct. 14	\$15.00, Feb. 18:	\$12.25, Oct. 28
1929.....	2.412c., April 2:	2.362c., Oct. 29		18.71, May 14:	18.21, Dec. 17	17.58, Jan. 29:	14.08, Dec. 3
1928.....	2.391c., Dec. 11:	2.314c., Jan. 3		18.59, Nov. 27:	17.04, July 24	16.50, Dec. 31:	13.08, July 2
1927.....	2.453c., Jan. 4:	2.293c., Oct. 25		19.71, Jan. 4:	17.54, Nov. 1	15.25, Jan. 11:	13.08, Nov. 22
1926.....	2.453c., Jan. 5:	2.403c., May 18		21.54, Jan. 5:	19.46, July 13	17.25, Jan. 5:	14.00, June 1
1925.....	2.560c., Jan. 6:	2.396c., Aug. 18		22.50, Jan. 13:	18.96, July 7	20.83, Jan. 13:	15.08, May 5

showing no hurry in placing their forward contracts on the new price basis. The larger mills will begin work on anticipated tonnage in a short time.

### Strip Steel

Specifications for strip steel this month are approximately equal to those of September with most makers, although one or two makers report a gain and others a slight loss. A better than usual demand is reported from makers of radios and washing machines, but the former group will soon have completed production for the holiday trade. Little automobile tonnage is coming out, and light requirements from the Ford Motor Co. are discouraging. Some of this loss is offset by heavier demand from the General Motors subsidiaries, which are beginning production on new models. Strip prices are fairly well maintained. Cold-rolled material is still quotable at a range of \$2 a ton, with 2.35c., Pittsburgh, as a minimum, while hot-rolled is unchanged at 1.60c. to 1.65c. on the wider sizes and 1.70c. to 1.75c. on the narrow.

### Bolts, Nuts and Rivets

With little improvement in demand, makers of bolts and nuts find encouragement in the comparative stability of prices in their industry. Scarcely any shading is reported among manufacturers, although the resale price is not rigidly maintained by jobbers in some sections. Operations are unchanged at about 40 per cent of capacity.

### Cold-Finished Steel Bars

Business shows no improvement, with orders fairly numerous, but in exceedingly light volume. Demand from jobbers is particularly dull, but a few mills are seeking business which might ordinarily go to the distributors. The official price is unchanged at 2.10c., Pittsburgh, a figure which applies to the majority of spot business being placed currently.

### Warehouse Business

Orders for steel out of warehouse are fairly numerous, but generally for small amounts. Aggregate business this month compares favorably with that of September, but distributors are unable to report any noticeable gain. Prices on plates and structural shapes are notably unchanged at 2.85c. a lb., subject to the

usual quantity differentials, and bars and small shapes are holding at 2.75c. Quotations on black and galvanized sheets are weaker and nails and wire and spikes have been reduced. Nails are now quoted nominally at \$2.25 a keg, but have been subject to severe shading. Small spikes have been offered freely at as low as 3.05c. a lb., and have been sold at less.

### Coke

Improved demand for domestic coal and coke has given the market a better tone, although the heavy surplus of slack on track has not been reduced materially and is an unpleasant factor. Furnace coke is still quotable at \$2.60, Connellsville, although producers might shade this figure on desirable business.

### Old Material

In the absence of mill buying in this district, scrap prices have declined throughout the list, and the market is approaching the lowest levels in the last decade. Heavy melting steel is nominally quoted at \$14 to \$14.50, with dealers offering to sell at prices even under the lower figure. No attempts are being made to secure

higher than \$14.50. Dealers' buying prices are likewise lower, and distress material can be picked up at as little as \$13.50 a ton. Hydraulic compressed sheets have also declined, and machine shop turnings have been sold at \$7. One mill has also bought heavy breakable cast at \$10 and less, and specialties are weak in spite of a reported sale at \$17.50 by one dealer.

The trend of the market is not clearly defined and still depends largely upon the attitude of mills. The smaller independent companies do not seem to be interested, and, in the absence of purchases from other sources, dealers are willing to see the market sell off in order that they may build up yard stocks at attractive prices.

The Pittsburgh chapter of the Institute of Scrap Iron and Steel, Inc., has authorized the appointment of a special trade relations committee to cooperate with mills in the Pittsburgh district in adjusting complaints with reference to rejected cars that are alleged to be in violation of the code of business practices of the institute.

The monthly scrap list of the Baltimore & Ohio, closing on Nov. 3, contains 9350 tons of scrap, including 2200 tons of No. 1 heavy melting steel. The Norfolk & Western list, closing Nov. 7, contains only 3700 tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel...	\$14.00 to \$14.50
No. 2 heavy melting steel...	10.50 to 11.00
Scrap rails .....	14.00 to 14.50
Compressed sheet steel...	13.75 to 14.25
Bundled sheets, sides and ends .....	11.50 to 12.00
Cast iron carwheels .....	13.50 to 14.00
Sheet bar crops, ordinary .....	14.50 to 15.00
Heavy breakable cast .....	9.50 to 10.00
No. 2 railroad wrought .....	14.00 to 14.50
Hvy. steel axle turnings .....	12.00 to 12.50
Machine shop turnings .....	6.50 to 7.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers .....	16.50 to 17.00
Railr. coil and leaf springs .....	16.50 to 17.00
Roller steel wheels .....	16.50 to 17.00
Low phos. billet and bloom ends .....	18.00 to 19.00
Low phos. mill plates .....	16.00 to 16.50
Low phos. light grades .....	16.00 to 16.50
Low phos. sheet bar crops .....	16.50 to 17.50
Heavy steel axle turnings .....	12.00 to 12.50
Electric Furnace Grades:	
Low phos. punchings .....	16.00 to 16.50
Heavy steel axle turnings .....	12.00 to 12.50
Blast Furnace Grades:	
Short shoveling steel turnings .....	8.00 to 8.50
Short mixed borings and turnings .....	8.00 to 8.50
Cast iron borings .....	8.00 to 8.50
Rolling Mill Grades:	
Steel car axles .....	19.50 to 20.00
Cupola Grades:	
No. 1 cast .....	12.50 to 13.00
Rails 3 ft. and under .....	15.00 to 15.50

\*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

# CHICAGO

## Close Range Steel Buying Brings Frequent Fluctuations in Operations

CHICAGO, Oct. 28.—Sharp fluctuations in open-hearth operations are resulting from the practice of buyers in entering steel orders at close range for immediate shipment. The mills scarcely know at the beginning of a week what they will be doing at the end of the week. One producer, for example, is starting out this week at a 60 per cent rate, but the releases on hand are not sufficient to sustain this rate all week, and unless more business comes in its operations will taper off.

Ingot output for the entire district remains close to 57 per cent of capacity. Conjectures as to the future course of steel shipments are varied. In general, local sellers are of the opinion that the next eight to 10 weeks will show little variation.

Several railroads that have bought rails have entered specifications and it is understood that mills have wide latitude in scheduling these rollings. With this advantage, it is quite probable that deficiencies in tonnages of other products, should they occur, will be made up with rails, thereby affording producers an opportunity to hold output on a fairly even keel.

### Ferroalloys

A cargo of spiegeleisen, loaded at Buffalo, has been docked at Indiana Harbor. It is understood that this is the product of a foreign furnace.

### Coke

Shipments of by-product foundry coke are holding to the gain which has been consistently shown in October. The price is steady at \$8 a ton, local ovens.

### Pig Iron

Shipments of Northern iron are not as brisk as a week ago and conditions now are not so favorable as earlier in the month for a gain in October over those of September. The melt is extremely spotty and the net gain shown in some quarters does not appear to offset losses in others. However, sales are still in good volume, much of the tonnage being taken for delivery after the turn of the year. A user in Wisconsin is said to have bought 2500 tons of base grade Southern iron at a shade under \$11 a ton, Birmingham, or \$17.71, delivered, this being about 80c. a ton under the delivered price of Northern iron. Irregularities are noted in prices for charcoal iron, though most of the tonnage moving is at the schedule of \$24 a ton, furnace. The Wells furnace was lighted last week, making four charcoal units now in blast. Silvery is moving in carload lots at current quotations. Siz-

Small orders for quick shipment bring frequent and sharp fluctuations in steel mill operations.

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Ingot output for the district remains at about 57 per cent for this week.

\* \* \*

Rail rollings may offset to some extent lack of tonnage in other products.

\* \* \*

Scrap market decidedly weak, with declines in many grades ranging from 25c. to \$2 a ton.

able tonnages of silvery and Lake Erie iron are on Chicago docks.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	\$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	27.04
S'th'n No. 2 fdy.	17.51
Low phos., sil. 1 to 2 cop-per free	\$28.50 to 29.20
Silvery, sil. 8 per cent.	26.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

### Structural Material

Awards to Chicago district fabricators total 4000 tons for the week, which is a somewhat better showing than the average of recent weeks. Fresh inquiries from nearby points total slightly more than 6000 tons. The outlook for the future is not bright. Small lettings are more numerous, but these will not fill shops, and competition remains severe. In the election campaign that will end next Tuesday bond issues, which can result in substantial steel orders, are being bitterly contested. Architects' boards contain little in the way of projects that lend real support to the steel market. The situation seems to be that many plans have been completed well into the future, but final action awaits improvement in general business and a more favorable financing situation.

Preliminary estimates, which are said to be conservative, place the tonnage to be needed for the new Chicago Post Office at 25,000 tons. Surveys of the site are being made, and there appears to be some hope that construction work will be started soon after the turn of the year. The general contract for the Western Hills viaduct near Cincinnati, requir-

ing 5000 tons of shapes and 4000 tons of bars, has been let to the McDougall Construction Co., Atlanta, Ga., and bids will be opened this week at Indianapolis on 9000 tons for a bridge at Evansville, Ind.

### Warehouse Business

Movement from Chicago district warehouses has shown little improvement in October, though the moderate gain in business registered in September is being held. The situation is disappointing to warehousemen, who can normally rely on the early fall days to be among the best in the year. Prices are steady at the levels prevailing a week ago.

### Plates

Miscellaneous demand for plates shows improvement, but pipe manufacture, which has been the backbone of the plate business for many months, is gradually diminishing. Shipments of skelp are rather sharply curtailed, following failure of pipe manufacturers to get releases against old contracts. Although old orders for pipe appear to be moving slowly, there is an encouraging amount of new business coming into the market. A Youngstown mill has booked more than 1500 tons of new pipe business. Anacortes, Wash., will buy 2000 tons of gas pipe to be shipped to the Pacific Coast.

New business in steel tanks is in good volume, and inquiries promise substantial tonnage for the future. Several tank fabricators have ordered a total of 1000 tons of plates from mills to round out depleted stocks. Oil refiners in the Southwest have placed contracts for tanks that call for 2000 tons of plates, and fresh inquiries account for an additional 5000 tons. Shipments will soon be under way on the 6000 tons of steel needed for the cars recently ordered by the Chicago Great Western. Car shops in this district are all but idle, and prospects for new business are unimproved.

The plate price remains steady at 1.70c. a lb., Chicago.

### Bars

Both specifications and short-term purchases of mild steel bars remain close to the level of last week, which was the second consecutive week in which gains were registered. Consumption shows a satisfactory breadth, but needs are small and orders are in general for immediate shipment. Road machinery manufacturers, having enjoyed a satisfactory volume of business in recent months, are now less heavily engaged, with the exception of those which manu-



facture snow plows. Agricultural implement makers continue to mark time in the matter of production for spring delivery. The bulk of their product at present is for shipment to Russia.

Use of alloy steel bars shows little change in the last week, and demand for iron bars has not climbed from the depths it reached early in the summer. Rail steel bar mill operations are holding the gains made earlier in the month, and present bookings assure satisfactory production well into November. The average size of current orders is growing slowly and practically all business is entered for quick shipment from mills. The price is steady at 1.65c. a lb., district mill.

### Wire Products

Use of wire by the manufacturing trade is expanding slowly, due in large measure to greater demand by the furniture trade. Jobbers, on the other hand, are moving smaller quantities, as is usual at this time of year, and they appear to be fairly well satisfied with the state of their stocks. A moderate increase in residential building is reflected in a slightly larger movement of nails, stocks of which are comparatively small at most distributing points.

### Cold-Rolled Strips

New buying is spotty and in small aggregate volume. Specifications are ample in number and size to support output at a steady rate.

### Bolts, Nuts and Rivets

Shipments of these commodities continue to run a trifle ahead of the rate in the preceding month. Releases are scarce from manufacturers of farm equipment, who still look to the early part of November as the time when they may expand operations.

### Cast Iron Pipe

With the exception of 550 tons of 8 and 12-in. pipe ordered by Chicago, transactions in this market have been confined to scattered orders of single carload proportions. Lima, Ohio, will buy 275 tons of 6 and 10-in. pipe, and Detroit will close for 3500 tons of 24 and 30-in. pipe.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$44 to \$45; 4-in., \$47 to \$48; Class A and gas pipe, \$3 extra.

### Rails and Track Supplies

The Chicago & North Western has ordered 15,000 tons of rails and has renewed 15,000 tons on old contracts which were not specified in full during the current year. This railroad has on hand 3000 tons which has not been put in track. The new business was distributed as follows: 5400 tons to Inland Steel Co. and 9600 tons to Illinois Steel Co. The Baltimore & Ohio has purchased 75,000 tons, a part of which comes to the Inland Steel Co. The New York Central is expected to buy 175,000 tons, of which about 60 per cent may come to Western mills. Inquiries for track

supplies total 30,000 tons. Several railroads which already have made purchases have entered specifications for delivery this year.

Rail operations have been advanced slightly, but it seems quite probable that producers will not rush orders, preferring to distribute the tonnage to even out the production curve, which for finished steel products is subject to rather frequent fluctuations.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. Per lb.: Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars, 2.75c.

### Sheets

Demand is irregular, and output has receded to within the range of 50 to 55 per cent of capacity. The Inland Steel Co. plans to resume operations at Milwaukee next week.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.50c. to 2.60c.; No. 24 galv., 3.15c. to 3.25c.; No. 10 blue ann'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

### Reinforcing

This market continues to move in an even and listless course except for the temporary impetus of rush orders to take advantage of the days remaining before winter weather sets in. Awards during the week were confined to small and odd lots, and the only fresh inquiry of note is for the Wendell Phillips High School, Chicago, which may take 800 tons or more. Progress is being made on Chicago's new building code, which may become effective early in November. As this will define new stresses which will lower building costs, there is reason to believe that the delay in putting the code in use is retarding the building

### Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.00c.
Soft steel bars.....	2.90c.
Reinforc'g bars, billet steel—	
Less than 5 tons.....	2.85c.
5 tons to 30 tons.....	2.45c.
30 tons to 200 tons.....	2.00c.
200 tons and over.....	1.75c.
Rail steel reinforcement—	
Less than 5 tons.....	2.50c.
5 tons to 30 tons.....	2.10c.
30 tons and over.....	1.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.35c.
Flats and squares.....	3.85c.
Bands ⅜ in. in Nos. 10 and 12 gages.....	3.10c.
Hoops (No. 14 gage and lighter).....	3.65c.
Black sheets (No. 24).....	3.80c.
Galv. sheets (No. 24).....	4.35c.
Blue ann'd sheets (No. 10).....	3.35c.
Spikes (⅞ in. and larger).....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	4.00c.
Rivets, boiler.....	4.00c.
Per Cent Off List	
Machine bolts.....	60 and 10
Carriage bolts.....	60 and 10
Coach or lag screws.....	60 and 10
Hot-pressed nuts, sq., tap, or blank, 60 and 10	
Hot-pressed nuts, hex., tap., or blank, 60 and 10	
No. 8 black ann'd wire, per 100 lb. ....	\$3.45
Com. wire nails, base per keg.....	\$2.30 to 2.55
Cement c'd nails, base per keg.....	2.30 to 2.55

program. Many road lettings were scheduled for this week, but because of the lateness of the season it is quite probable that much of the tonnage needed will not be ordered until next spring.

### Old Material

For the most part, quotations in the Chicago scrap iron and steel market are nominal. Sales in recent weeks have been few and far between, and almost without exception each transaction has brought out a new low price. The Santa Fe has sold heavy melting steel at the equivalent of \$11.09 a gross ton, delivered. Cast iron borings, shipped from Chicago for delivery at St. Louis, have been sold at \$6.75 a ton, delivered. The freight rate is \$2.65 a ton. Railroads and other producers of scrap, as well as local yards, are pressing scrap on the market, with the result that distress tonnage is becoming an increasing threat to the price structure.

Prices deliv'd Chicago district consumers: Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$11.00 to \$11.50
Shoveling steel.....	11.00 to 11.50
Frogs, switches and guards, cut apart, and misc. rails	11.50 to 12.00
Hydraul. compressed sheets	9.00 to 9.50
Drop forge flashings.....	7.75 to 8.25
No. 1 busheling.....	8.00 to 8.50
Forg'd cast and r'd steel carwheels.....	14.25 to 14.75
Railroad tires, charg. box size.....	14.50 to 15.00
Railroad leaf springs cut apart.....	14.50 to 15.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	12.50 to 13.00
Coil springs.....	14.75 to 15.25
Electric Furnace Grades:	
Axle turnings.....	9.75 to 10.25
Low phos. punchings.....	12.00 to 12.50
Low phos. plates, 12 in. and under.....	12.00 to 12.50
Blast Furnace Grades:	
Axle turnings.....	6.00 to 6.50
Cast iron borings.....	4.50 to 5.00
Short shoveling turnings..	5.00 to 5.50
Machine shop turnings....	5.00 to 5.50
Rolling Mill Grades:	
Iron rails.....	11.50 to 12.00
Rerolling rails.....	13.50 to 14.00
Cupola Grades:	
Steel rails, less than 3 ft..	12.75 to 13.25
Steel rails, less than 2 ft..	13.00 to 13.50
Angle bars, steel.....	12.00 to 12.50
Cast iron carwheels.....	12.50 to 13.00
Malleable Grades:	
Railroad.....	13.00 to 13.50
Agricultural.....	11.25 to 11.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heavier.....	26.00 to 31.00

Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars.	11.50 to 12.00
Iron arch bars, and transoms.....	11.50 to 12.00
Iron car axles.....	20.50 to 21.50
Steel car axles.....	14.50 to 15.00
No. 1 railroad wrought...	9.00 to 9.50
No. 2 railroad wrought...	9.75 to 10.25
No. 1 busheling.....	6.50 to 7.00
No. 2 busheling.....	5.50 to 6.00
Locomotive tires, smooth..	13.00 to 13.50
Pipes and flues.....	6.50 to 7.00
Cupola Grades:	
No. 1 machinery cast.....	10.00 to 10.50
No. 1 railroad cast.....	9.00 to 9.50
No. 1 agricultural cast....	8.50 to 9.00
Stove plate.....	7.50 to 8.00
Grate bars.....	7.50 to 8.00
Brake shoes.....	7.50 to 8.00

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.



# CLEVELAND

## Demand for Steel Steady But Not Gaining— Ingot Output Lower

CLEVELAND, Oct. 28.—Demand for finished steel is being maintained at recent volume for practically all products. Orders are well diversified as to products and industries, although business from plants engaged in automotive work shows the sharpest recession when compared with the normal volume of business. Orders are only for small lots and generally for quick shipment.

A Cleveland steel plant, having accumulated a supply of semi-finished steel this week, shut down the four open-hearth furnaces it has been operating recently. This reduced local operations to 24 per cent of ingot capacity, or slightly less than during the previous low point at the end of August.

Little change in the volume of steel business is expected during the remainder of the year. Aside from increasing activity of the Chevrolet Motor Co., there is nothing to indicate an improvement in operations by the motor car industry during the next two months. The local Fisher Body plant has been delayed in getting under way in the manufacture of bodies for the new Chevrolet models, but is now operating at a fair rate and is expected to be in the market shortly for additional sheet requirements amounting to a considerable tonnage. The Ford Motor Co., with its reduced operations, is expected to show an October output of only about 50,000 cars.

Prices on most finished steel products are unchanged. Sheets are still irregular. On auto body sheets there is a spread from 3.40c. to 3.50c., depending usually on the location of the buyer. Reflecting the weakness on auto body and black sheets, steel furniture sheets are now commonly quoted at 3.60c.

### Pig Iron

The market shows very little life. Most consumers have enough iron under contract for early needs and buying is in small lots. No interest has been taken in first quarter contracts since the taking of a few orders for that delivery several weeks ago. October shipments will fall a little short of those of September. The lessened demand is due in part to curtailment of business from companies that supply material to the Ford Motor Co. A few jobbing foundries in this territory have increased operations. Some business in tire molds has come from rubber companies in Akron, where one or two rubber companies will increase operations next month. The Muncie, Ind., melter which inquired for 3000 tons of malleable iron is understood to have placed this business.

Foundry and malleable iron are quoted at \$16 to \$17, Lake furnace, al-

though the lower price has been shaded in a few cases. The market at some of the important competitive consuming points has settled to around \$18.50 to \$19, delivered, and furnaces with high freight rates have to name prices to meet the situation. Because of its recent blowing out of a merchant furnace, a Cleveland producer is expected to be less active than recently in soliciting business in outlying districts. In Cleveland, the \$17.50 price for local delivery is being maintained, as well as \$18 in Michigan.

### Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25.	\$17.50
S'th'n fdy., sil. 1.75 to 2.25.	\$17.51 to 18.01
Malleable .....	17.50
Ohio silvery, 8 per cent. ....	25.00
Stand. low phos., Valley...	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

### Plates, Shapes and Bars

Demand for steel bars shows little change. Mills are getting a fair number of orders, but all for small lots and largely from consumers outside of the automotive field. Alloy steel bars are moving slowly. Reinforcing bars are quiet. The Cleveland Stadium and Higbee store jobs requiring 770 tons are still pending. Contract has been placed for a grain elevator at Erie, Pa., requiring 570 tons. Plates are dull. Little structural work is pending. Considerable local grade crossing elimination work is in prospect.

Prices are steady and unchanged at 1.60c., Pittsburgh, for plates and shapes and at 1.60c., Cleveland, for steel bars for outside shipment and 1.65c. for local delivery.

### Strip Steel

Orders for hot-rolled strip gained slightly during the week from miscellaneous sources. Little effort is being made to get above 1.60c., Pittsburgh for wide strip and 1.70c. for narrow as consumers are able to buy less than car lots at these prices. Cold-rolled strip continues inactive, but the price is steady at 2.35c., Cleveland.

### Wire Products

Demand is very slow. A limited amount of business in manufacturers' wire is being taken at 2.30c., Cleveland, although some consumers claim they are able to buy at 2.20c.

### Bolts, Nuts and Rivets

Business in bolts and nuts this month shows a very slight gain over that of September. Rivet orders declined slightly as compared with the previous month. Rivet makers are

operating plants at about 40 per cent of capacity.

### Sheets

Demand shows very little change. Orders are confined to small lots for immediate needs, buyers insisting on quick shipment. Little business is coming from the automotive industry and other consuming industries do not show much activity. While the market is weak, there is little change in prices. Although some mills are still asking 2.45c., Pittsburgh, for black sheets, practically all the business is going at 2.35c. Steel furniture sheets are now generally quoted at 3.60c., the higher price having about disappeared. With the recent concession to 3.40c. on auto body sheets, that price is now recognized by several of the mills, although some effort is still being made to get 3.50c. Continuous mills quote No. 10 light plate at 1.80c. and No. 13 blue annealed at 1.95c.

### Coke

Ohio by-product foundry coke has been reestablished at \$7.75, ovens, for November shipment. Demand has improved slightly. Stimulated by the cold weather, by-product domestic coke is fairly active. This is holding to \$4, ovens.

### Old Material

Shipments in this territory are virtually at a standstill this week, as one local mill and one Valley district mill have shut off on scrap deliveries. Dealers are making limited purchases of material to deliver when shipments are released. The market is weak and some of these purchases are at 25c. a ton below recent ruling prices. Dealers' price on heavy melting steel in the Valley district has declined 50c. a ton to \$13.25.

### Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel...	\$11.25 to \$11.50
No. 2 heavy melting steel...	10.75 to 11.00
Compressed sheet steel...	11.00 to 11.50
Light bundled sheet	
stampings .....	9.00 to 9.25
Drop forge flashings.....	10.00 to 10.50
Machine shop turnings....	6.50 to 7.00
Short shoveling turnings...	7.75 to 8.00
No. 1 railroad wrought....	13.00 to 13.50
No. 2 railroad wrought....	14.00 to 14.50
No. 1 busheling.....	11.00 to 11.50
Pipes and flues.....	9.00 to 9.50
Steel axle turnings.....	12.50 to 13.00
Acid Open-Hearth Grades:	
Low phos., billet bloom	
and slab crops.....	17.50 to 18.00
Blast Furnace Grades:	
Cast iron borings.....	7.50 to 8.00
Mixed borings and short	
turnings .....	7.50 to 8.00
No. 2 busheling.....	7.00 to 7.50
Cupola Grades:	
No. 1 cast.....	13.00 to 13.50
Railroad grate bars.....	10.00 to 10.50
Stove plate .....	10.50 to 11.00
Rails under 3 ft.....	16.00 to 16.50
Miscellaneous:	
Rails for rolling.....	16.25 to 16.50
Railroad malleable .....	15.00 to 15.50

# NEW YORK

## Railroads Being Urged to Buy Equipment— Pig Iron and Steel Sales Small

NEW YORK, Oct. 28.—Pig iron demand has reached a low ebb. Sales, at 4500 tons, compare with 7000 tons in the previous week and 8500 tons two weeks ago. Inquiries are exceedingly light, and deliveries reflect no improvement in melt. With the end of the barge season approaching, some sellers are experiencing a gain in shipments; others report no change and one or two report a decline.

Prices are not getting much of a test under present conditions of slack demand, but apparently are about as low as they can go on the present basis of production costs. Stocks on furnace yards are large and the blowing out of additional stacks would not be surprising.

The Worthington Pump & Machinery Corp. is in the market for 250 tons of foundry iron for its Elmwood, Ohio, plant.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil.	1.75
to 2.25.....	\$20.41 to \$20.91
•Buff. No. 2, del'd east.	
N. J. ....	18.78 to 19.28
East. Pa. No. 2 fdy., sil.	
1.75 to 2.25.....	18.39 to 19.39
East. Pa. No. 2X fdy., sil.	
2.25 to 2.75.....	18.89 to 19.89

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

\*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

### Coke

Foundry coke specifications are in unchanged volume. Furnace coke prices range from \$2.50 to \$2.60 a net ton, Connellsville, while foundry coke specifications follow:

Special brands of beehive foundry coke, \$4.70 to \$4.85 a net ton, ovens, or \$8.41 to \$8.56 delivered to northern New Jersey, Jersey City and Newark, and \$9.29 to \$9.44 to New York and Brooklyn; by-product foundry coke, \$9 to \$9.40, Newark or Jersey City; \$10.06, New York or Brooklyn.

### Warehouse Business

Buying from warehouse stocks is steady, but continues at a low level, so that October is not generally expected to show an improvement from the September total of business. Structural steel demand is especially light. Although sheet buying continues fair, prices lack firmness and concessions of \$1 to \$3 a ton are not uncommon.

### Cast Iron Pipe

Except for an occasional inquiry for a substantial tonnage of pressure pipe, buying is limited to carload lots and less. A public utility, buying in New York, is in the market for about 4000 tons of pipe for shipment to the West. West Orange, N. J., has opened bids on about 1500 tons of 16 and 24-in. pipe required in an outlet trunk sewer. Colonie, N. Y., is inquiring for a small tonnage. Prices are unchanged,

despite lack of business, current quotations ranging from \$36 to \$37 a net ton, f.o.b. Northern foundry.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, \$38.90 to \$39.90; 4-in. and 5-in., \$41.90 to \$42.90; 3-in., \$48.90 to \$49.90. Class A and gas pipe, \$3 extra.

### Finished Steel

With the outlook for general steel business over the remainder of the year none too bright, interest centers in probable purchases by the railroads. Pressure is being brought to bear on some of the railroad companies to place orders for cars and locomotives. It is said that efforts are being made so that equipment purchases can be financed to their full amount. Normally, equipment trust certificates cover only 80 per cent of the expenditures, the remaining 20 per cent being paid in cash. If arrangements can be made whereby the 20 per cent cash payments can be carried on credit for a time, it is said that a number of railroads may avail themselves of the opportunity to buy equipment which would require no immediate cash outlay. A similar financing plan is being suggested for the purchase of 289 subway cars by the Interborough Rapid Transit Co., New York.

There has been a further delay in the issuance of the New York Central rail inquiry, which probably will call for about 175,000 tons. The Delaware, Lackawanna & Western is expected to buy about 16,000 tons in addition to the 2500 tons recently

ordered. The Board of Transportation, New York, has taken bids on 10,000 tons of rails and the necessary trackwork and accessories for subways.

No gains in steel orders are reported by local sales offices. On a small volume of business, prices continue to show weakness, though are not quotably lower with the possible exception of galvanized sheets, which are being quite freely sold at 2.95c., Pittsburgh, with a few sales at 2.90c. a lb. Most of the black sheet sales are at 2.40c., Pittsburgh, with 2.35c. applying on the more desirable orders. The 2.45c. price has disappeared even on small lots. On cold-rolled strip, 2.35c., Pittsburgh or Cleveland, is available even to small buyers. Hot-rolled strip appears to be none too firm at 1.60c. for wide material and 1.70c. for narrow.

### Reinforcing Bars

Demand is tapering, with the bulk of current business made up of small tonnages.

For mill shipment, distributors of concrete bars quote 1.70c. a lb., Pittsburgh, on building and paving work, and 1.80c. on subway work (rail steel offered at \$4 a ton less); for delivery from local stock, 2.35c. a lb., New York, up to 3.05c. a lb. for lots of less than 2 tons.

### Old Material

Although an eastern Pennsylvania consumer bought about 5000 tons of No. 1 heavy melting steel last week at \$11.50 a ton, delivered, brokers completing contracts in eastern Pennsylvania are still paying \$12, or \$8.50, New York. For barge shipment to a consumer at Bridgeport, Conn., \$9 a ton, New York, is offered. Other grades of scrap are off about 50c. a ton, on the basis of recent sales to consumers at lower prices.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel..	\$8.50 to \$9.00
Heavy melting steel (yard)	5.75 to 6.00
No. 1 hvy. breakable cast..	8.00
Stove plate (steel works)..	5.50 to 6.00
Locomotive grate bars....	5.50 to 6.00
Machine shop turnings....	5.00
Short shoveling turnings..	5.00
Cast borings (blast fur. or steel works) .....	4.50
Mixed borings and turnings .....	4.50
Steel car axles.....	17.00
Iron car axles.....	19.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	7.25 to 7.75
Forge fire .....	7.00 to 7.50
No. 1 railroad wrought....	8.75 to 9.25
No. 1 yard wrought, long..	7.75 to 8.25
Rails for rolling.....	9.25 to 9.75
Stove plate (foundry)....	6.00 to 6.50
Malleable cast (railroad)...	10.00 to 10.50
Cast borings (chemical)...	8.50 to 9.00
Prices per gross ton, deliv'd local foundries:	
No. 1 machry. cast.....	\$13.50
No. 1 hvy. cast (columns, bldg. materials, etc.) ; cupola size.....	11.50
No. 2 cast (radiators, cast boilers, etc.) .....	11.00

### Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars, small shapes.....	3.10c.
Iron bars .....	3.24c.
Iron bars, Swed. charcoal... ..	7.00c. to 7.25c.
Cold-fn. shafting and screw stock—	
Rounds and hexagons.....	3.40c.
Flats and squares.....	3.90c.
Cold-roll. strip, soft and quarter hard .....	4.95c.
Hoops .....	3.75c.
Bands .....	3.40c.
Blue ann'd sheets (No. 10).....	3.25c. to 3.40c.
Black sheets (No. 24*).....	3.65c. to 3.75c.
Galvanized sheets (No. 24*).....	4.25c.
Long terme sheets (No. 24).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galv. annealed.....	5.15c.
Tire steel, ½ x ½ in. and larger... ..	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger .....	3.75c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller.....	.65
1 x 30 in. and smaller.....	.65
Carriage bolts, cut thread:	
¾ x 6 in. and smaller.....	.65
¾ x 20 in. and smaller.....	.65
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.....	\$19.00
Seamless steel, 2-in.....	20.25
Charcoal iron, 2-in.....	26.25
Charcoal iron, 4-in.....	67.00



# PHILADELPHIA

## Steel Buying Smaller—B. & O. Buys 75,000 Tons of Rails

PHILADELPHIA, Oct. 28.—Steel business has declined further, and mill operations in eastern Pennsylvania now range from 45 to 50 per cent, with the leading independent interest at about 52 per cent of rolling capacity. Prices show no additional decline. Plates and shapes are being held with only occasional concessions of \$1 a ton on desirable tonnages. Sheet prices still lack firmness, but only a small amount of business is being booked. Iron and steel scrap quotations continue their downward trend, and in the past week about 5000 tons of No. 1 heavy melting steel has been bought by one consumer at \$11.50 a ton, delivered.

Bids will be opened this week on a large gas holder for the United Gas Improvement Co., Philadelphia, requiring about 2400 tons of plates and 800 tons of shapes. Low bid on four vessels for the Grace Line, on which nearby shipyards were quoting, was submitted by the Federal Shipbuilding & Dry Dock Co., Kearny, N. J.

The Baltimore & Ohio Railroad has allocated its 1931 rail requirements, totaling 75,000 tons, to the Carnegie Steel Co., Bethlehem Steel Co. and Inland Steel Co. This railroad will shortly begin construction in its own shops of 1000 steel box cars and 1000 heavy service gondolas. The Pennsylvania Railroad has not yet inquired for next year's rail requirements, estimated at 250,000 tons.

### Pig Iron

Buying has declined to the carload business that characterized business during the summer. Southern pig iron is still offered to eastern Pennsylvania users at \$11.50 a ton, Birmingham, or \$16.50 to \$16.75, on docks Philadelphia, depending upon the size of the tonnage shipped. Bids were opened last week on about 200 tons of Nos. 2, 2X and 1X foundry iron for Cavite, Philippine Islands, by the Navy Department, Washington. Rolph, Mills & Co., San Francisco, were low.

#### Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$18.76 to \$19.26
East. Pa. No. 2X, 2.25 to 2.75	19.26 to 19.76
East. Pa. No. 1X, 1.75 to 2.25	19.76 to 20.26
Basic (del'd east. Pa.)	17.75 to 18.25
Malleable	21.00
Stand. low phos. (f.o.b. east. Pa. furnace)	24.00
Cop. b'rg low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

### Steel Bars

Business in carload lots and less, at 1.60c. a lb., Pittsburgh, or 1.89c., delivered Philadelphia, continues in

fair volume. Billet steel reinforcing bars range from 1.70c. to 1.75c., Pittsburgh, or 1.99c. to 2.04c., Philadelphia, and rail steel bars are about 1.55c., Franklin, Pa., or 1.84c., delivered Philadelphia.

### Shapes

While concessions have developed from 1.70c., f.o.b. nearest mill to consumer, these do not exceed \$1 a ton even on substantial tonnages. Construction projects in this district include 400 tons of steel for the Pocono Towers Hotel, Pocono, Pa., and about 250 tons for an office building at 2300 North Broad Street, Philadelphia.

### Plates

Among inquiries calling for substantial plate tonnages is a gas holder for the United Gas Improvement Co., Philadelphia, requiring 2400 tons. While local tank fabricating shops are bidding on this project, it is suggested that the contract may be awarded outside the district. Some pressure for concessions from 1.70c., Coatesville, Pa., or 1.80½c., Philadelphia, is still offered by buyers, but without much success.

### Sheets

Demand for sheets is smaller than in a number of weeks, except for a fairly steady volume of buying by local radio manufacturers, two of which have stepped up their output to 6500 and 7500 sets a day respectively, while a third continues at 2000 sets a day. Blue annealed sheets, No. 13 gage, range from 2.05c. to 2.15c. a lb., Pittsburgh, or 2.34c. to 2.44c., delivered Philadelphia, and blue annealed plates, No. 10 gage, are 1.90c. to 2c., Pittsburgh, or 2.19c. to 2.29c., Philadelphia. Black sheets are generally quoted at 2.35c., Pittsburgh, or 2.64c., Philadelphia, which appears to be the market for small as well as medium-sized orders. Galvanized sheets range from 2.90c. to 3c., Pittsburgh, or 3.19c. to 3.29c., delivered Philadelphia. Manufac-

turers point out that the present margin between black and galvanized sheets of 55c. to 65c. a 100 lb. is insufficient to cover the cost of galvanizing, even with low-priced zinc.

### Imports

In the week ended Oct. 25, arrivals of pig iron at this port reached a total of 2552 tons, of which 2502 tons was from British India and 50 tons from the Netherlands. A shipment of 720 tons of chrome ore was received from Greece, and 51 tons of structural shapes arrived from Belgium.

### Old Material

Transactions continue limited, but where purchases have been made lower prices have developed. About 5000 tons of No. 1 heavy melting steel has been bought at \$11.50 a ton, delivered Bethlehem, Pa., and a small tonnage of No. 2 heavy melting steel has been closed at \$10 a ton, delivered Phoenixville, Pa. Machine shop turnings have brought \$7.50, Phoenixville. Other grades of scrap are unchanged in the absence of business.

#### Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$11.50 to \$12.50
No. 2 heavy melting steel	10.00
Heavy melting steel (yard)	9.50
No. 1 railroad wrought	14.00
Bundled sheets (for steel works)	9.00
Hydraulic compressed, new	10.00 to 11.00
Hydraulic compressed, old	9.00 to 9.50
Machine shop turnings (for steel works)	7.50 to 8.50
Heavy axle turnings (or equiv.)	11.00 to 11.50
Cast borings (for steel works and roll. mill)	8.50
Heavy breakable cast (for steel works)	11.50
Railroad grate bars	9.50
Stove plate (for steel works)	9.50
No. 1 low phos., hvy., 0.04% and under	20.00
Couplers and knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
No. 1 blast f'nace scrap	7.50 to 8.00
Wrot. iron and soft steel pipes and tubes (new specific.)	12.00
Shafting	18.00 to 18.50
Steel axles	20.50 to 21.00
No. 1 forge fire	11.00 to 11.50
Cast iron carwheels	15.00
No. 1 cast	13.00 to 13.50
Cast borings (for chem. plant)	14.00 to 14.50
Steel rails for rolling	13.50 to 14.00

### Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.50c. to 2.60c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to ¼-in. inclu.	2.90c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.60c.
†Galvanized sheets (No. 24)	4.15c.
Light plates, blue annealed (No. 10)	3.05c.
Blue ann'l'd sheets (No. 13)	3.20c.
Diam. pat. floor plates, ¼-in.	5.20c.
Swedish iron bars	6.60c.

\*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.  
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

### Fabricated Plate Orders Higher In September

WASHINGTON, Oct. 28.—Orders for fabricated steel plate rose to 33,602 tons in September from 29,235 tons in August, according to reports received by the Department of Commerce from 48 firms. The September orders were distributed as follows: Oil storage tanks, 14,106 tons; refinery materials and equipment, 4865 tons; tank cars, 546 tons; gas holders, 487 tons; blast furnaces, 514 tons; miscellaneous, 13,084 tons.

# BOSTON

## Pig Iron Sales Less Than 1500 Tons—Scrap Is Weaker

BOSTON, Oct. 28.—Pig iron sales the past week fell short of 1500 tons. Transactions were mostly in car lots either for prompt or early November shipment. While Buffalo No. 2 plain, No. 2X and No. 1X iron can still be purchased at \$15.50 a ton, furnace, the interest making this price was inactive in New England the past week, and the bulk of the No. 2X iron sold was at \$16 and the No. 1X at \$16.50. East of Buffalo furnaces also received better prices for their iron. For the first time in many months furnaces have been asked to extend credit.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25..	\$19.78 to \$20.28
†Buffalo, sil. 2.25 to 2.75..	19.78 to 20.28
*Buffalo, sil. 1.75 to 2.25..	20.41 to 20.91
*Buffalo, sil. 2.25 to 2.75..	20.91 to 21.41
Va., sil. 1.75 to 2.25.....	25.21
Va., sil. 2.25 to 2.75.....	25.71
*Ala., sil. 1.75 to 2.25.....	21.11
*Ala., sil. 2.25 to 2.75.....	21.61
†Ala., sil. 1.75 to 2.25.....	17.25
†Ala., sil. 2.25 to 2.75.....	17.75

Freight rates: \$4.91 all rail and \$4.28 rail and water from Buffalo; \$5.21 all rail from Virginia; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

\*All rail rate.

†Rail and water rate.

### Cast Iron Pipe

The Warren Foundry & Pipe Co. was low bidder on 745 tons of 16-in. pipe and about 40 tons of miscellaneous sizes for Marblehead, Mass. Northampton, Mass., has purchased 8000 ft. of 6-in. pipe from the United States Pipe & Foundry Co. Prices on 6-in. and larger sizes are usually \$36 a ton, foundry. A \$3 differential is asked on Class A and gas pipe.

### Warehouse Business

Warehouses have reduced wire nails 10c. a keg. The price from stock is now \$2.90 a keg, base. For direct mill shipments, in car lots, \$2

### Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates .....	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees .....	3.365c.
Zees .....	3.365c.
Soft steel bars, small shapes.....	3.265c.
Plats, hot-rolled .....	4.15c.
Reinforcing bars .....	3.265c. to 3.54c.
Iron bars—	
Refined .....	3.265c.
Best refined .....	4.60c.
Norway rounds .....	6.60c.
Norway squares and flats.....	7.10c.
Spring steel—	
Open-hearth .....	5.00c. to 10.00c.
Crucible .....	12.00c.
Tire steel .....	4.50c. to 4.75c.
Bands .....	4.015c. to 5.00c.
Hoop steel .....	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.....	3.50c. to 5.55c.
Squares and flats.....	4.00c. to 7.05c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.50c.
Per Cent Off List	
Machine bolts .....	60 and 5
Carriage bolts .....	60 and 5
Lag screws .....	60 and 5
Hot-pressed nuts .....	60 and 5
Cold-punched nuts .....	60 and 5
Stove bolts .....	70 and 10

a keg, base, is the prevailing price, and in less than car lots, \$2.25.

### Fabricated Steel

The New England Structural Co. will fabricate half of the steel for the plant of the Simonds Saw & Steel Co., Fitchburg, Mass. The Austin Co., which has the general contract, will fabricate the other half. A bridge job at Tyngsboro, Mass., involving 1200 tons of steel, was let the past week. It is understood that fabricators will soon have a sizable number of bridge jobs to figure, some of which will be built this year and some early in 1931.

### Old Material

One broker's October business will run considerably in excess of his September sales, but the trade as a whole will have done less in October than in any month since 1921. Possibly 75 per cent of the past week's business was in steel turnings and mixed borings and turnings. Prices for the latter dropped below \$3 a ton, sales being recorded at \$2.75 a ton, on cars shipping point, and at \$2.85, with the extreme top price \$3.10. Prices paid for steel turnings ranged from \$3.10 a ton to \$3.60, off 50c.

## ST. LOUIS Pig Iron Market Shows a Slight Improvement—Steel Demand Unchanged

ST. LOUIS, Oct. 28.—An improvement in the pig iron situation in the St. Louis industrial district is reported by makers. While current buying is quite small and confined to immediate needs, specifications against contracts are said to be much better. Prices also are said to be firmer. The price of \$11.50, f.o.b. Birmingham, made by a leading Southern furnace, may be withdrawn, it is stated. The improvement in this district is due to the increase in activities of the stove manufacturing interests, which are said to be doing a good business.

### Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill...	\$17.50
Malleable, f.o.b. Granite City .....	17.50
N'th'n No. 2 fdy., deliv'd St. Louis .....	19.66
Southern No. 2 fdy., deliv'd .....	\$15.92 to 16.42
Northern malleable, deliv'd .....	19.16 to 19.66
Northern basic, deliv'd....	19.16 to 19.66
Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.	

### Finished Steel

Specifications for plates, shapes and bars against contracts and new business show little change. Warehouse business fell off during the first two weeks of October as compared with the preceding month, but since then there has been a marked improvement, and the month is expected to equal September's volume. With-

and a new low record for this movement. Prices paid for No. 1 heavy melting steel are \$7.85 to \$8.10 a ton, with the market decidedly soft and demand extremely light. Quotations on railroad wrought and forge scrap are largely a matter of guesswork, due to the protracted spell of inactivity. Rails are going begging, and there is hardly enough business in steel mill borings, long bundled skeleton, forge flashings and axles to establish prices. A Portland, Me., mill is still taking shafting. Chemical borings prices are the only ones holding their ground. Such borings are in excellent demand and scarce.

### Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel..	\$7.85 to \$8.10
Scrap T rails .....	7.85 to 8.10
Scrap girder rails.....	6.85 to 7.10
No. 1 railroad wrought....	8.00 to 8.50
Machine shop turnings....	3.10 to 3.60
Cast iron borings (steel works and rolling mill) ..	3.10 to 3.60
Bundled skeleton, long....	6.00 to 6.50
Forge flashings.....	6.00 to 6.50
Blast furnace borings and turnings .....	2.75 to 3.10
Forge scrap .....	5.50 to 6.50
Shafting .....	13.00 to 14.00
Steel car axles .....	16.00 to 18.00
Wrought pipe, 1 in. in diameter (over 2 ft. long) ..	7.00 to 7.50
Rails for rolling.....	10.00 to 10.25
Cast iron borings, chemical ..	9.00 to 9.50

### Prices per gross ton deliv'd consumers' yards:

Textile cast .....	\$11.00 to \$11.50
No. 1 machinery cast.....	13.00 to 14.00
No. 2 machinery cast.....	10.50 to 11.50
Stove plate .....	8.00 to 8.50
Railroad malleable .....	14.00 to 14.50

in the last 10 days some fair-sized orders have been received, with no one item outstanding. The Laclede Steel Co. obtained the order for 655 tons of reinforcing bars for the Globe-Democrat Building. The Century Electric Co.'s foundry addition will require 125 tons of structural steel.

### Old Material

Considerable activity in cast iron borings and shoveling turnings marked the week in scrap, an open order for these items having been given by the leading consumer in this

### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-fin. rounds, shafting, screw stock .....	3.60c.
Black sheets (No. 24).....	4.25c.
Galv. sheets (No. 24).....	4.60c.
Blue ann'd sheets (No. 10) ..	3.45c.
Black corrug. sheets (No. 24) ..	4.10c.
Galv. corrug. sheets.....	4.70c.
Structural rivets .....	4.15c.
Boiler rivets .....	4.15c.
Per Cent Off List	
Tank rivets, 7/8-in. and smaller, 100 lb. or more .....	65
Less than 100 lb.....	60
Machine bolts .....	60
Carriage bolts .....	60
Lag screws .....	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50



district, which had been out of the market since last April and had received no shipments against contracts since last July. A large tonnage has been placed, and buying continues. The result has been that the price paid by dealers has been advanced 75c. a ton. A sale also was made of No. 2 heavy melting steel, which declined 25c. a ton, as did selected heavy melting steel, railroad springs, rails for rolling, railroad malleable and No. 2 railroad wrought. No. 1 busheling, heavy turnings and steel angle bars are 50c. lower.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	\$11.00 to \$11.50
No. 1 heavy melting or shoveling steel	10.25 to 10.75
No. 2 heavy melting or shoveling steel	9.50 to 10.00
No. 1 locomotive tires	12.50 to 13.00
Misc. stand-sec. rails including frogs, switches and guards, cut apart	11.75 to 12.25
Railroad springs	13.25 to 13.75
Bundled sheets	6.50 to 7.00
No. 2 railroad wrought	10.25 to 10.75
No. 1 busheling	7.00 to 8.00
Cast iron borings and shoveling turnings	6.25 to 6.75
Iron rails	10.00 to 11.00
Rails for rolling	12.50 to 13.00
Machine shop turnings	4.00 to 4.50
Heavy turnings	8.00 to 8.50
Steel car axles	16.50 to 17.00
Iron car axles	20.50 to 21.00
Wrot. iron bars and trans.	13.50 to 14.00
No. 1 railroad wrought	8.50 to 9.00
Steel rails, less than 3 ft.	14.00 to 14.50
Steel angle bars	11.00 to 11.50
Cast iron carwheels	11.50 to 12.00
No. 1 machinery cast	10.50 to 11.00
Railroad malleable	10.25 to 10.75
No. 1 railroad cast	10.25 to 10.75
Stove plate	9.00 to 9.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00
Agricult. malleable	10.00 to 10.50

## Youngstown

Active Blast Furnaces Now  
10 of 34

YOUNGSTOWN, Oct. 28.—The Youngstown Sheet & Tube Co., which last week started a blast furnace in its Hubbard, Trumbull County, group, this week suspended one of its Campbell stacks, reducing the number of active blast furnaces in the Mahoning Valley to 10 of 34. Of 51 independent open hearth furnaces, 27 are active.

Otherwise, the Valley industry continues to operate in this district on a 50 per cent average basis, with sheet and strip mills at a somewhat lower rate. Commercial operation of the new electric pipe mill of the Youngstown Sheet & Tube Co. is under way, following a period of experimenting. The company has enough unfilled orders for this mill to insure its steady operation over the remainder of the year.

### Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.40c.
Black sheets (No. 24)	4.35c.
Blue ann'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.00c.
Struc. rivets, 1/2-in. and larger	5.00c.
Com. wire nails, base per keg	\$3.35
Cement c't'd nails, 100 lb. keg	3.35

## PACIFIC COAST

Pipe Award Calls for 10,000 Tons  
—250-Mile Line Projected

SAN FRANCISCO, Oct. 25.—(By Air Mail)—The bright spot in the Pacific Coast iron and steel market this week was the award of 10,000 tons of plates for a pipe line in Seattle to the Western Pipe & Steel Co. Several new projects of size have come up for figures, including 5000 tons of plates for a pipe line for San Francisco. The price situation is not firm. The range in quotations on some commodities is rather wide.

### Bars

A fair tonnage of reinforcing steel was placed. Among the larger lots were 600 tons for the Textile Towers, Seattle, booked by the Pacific Coast Steel Corp., 450 tons for the Mills Building, San Francisco, placed with Gunn, Carle & Co., and 226 tons for a culvert at Tucson, Ariz., awarded to an unnamed interest. Inquiries were confined to small lots. Out-of-stock prices on carload lots of reinforcing bars in the Los Angeles and San Francisco districts continue at 2.50c., base. Mild steel bars are weak; 2.10c., c.i.f., appears general, with some quotations of 2.05c. Movement involves relatively small tonnages.

### Structural Steel

Structural lettings were mostly in lots of less than 100 tons. The Pacific Coast Steel Corp. took 500 tons for a steel pole line for the Southern Sierras Power Co. at Calipatria, Cal., and 300 tons for a steel pole line for the Pacific Gas & Electric Co. at Salinas, Cal. The McClintic-Marshall Co. booked 103 tons for the Valle Vista bridge at Hewett, Cal. Only one new inquiry of importance developed, this involving 4000 tons of shapes for the Pacific Fruit Express Co., San Francisco, bids on which will be opened Oct. 29. Plain material ranges from 2.15c. to 2.25c., c.i.f.

### Cast Iron Pipe

Only two awards of size are re-

### Pig iron prices per gross ton at San Francisco:

*Utah basic	\$22.00 to \$24.00
*Utah fdy., sil. 2.75 to 3.25	22.00 to 24.00
**Indian fdy., sil. 2.75 to 3.25	22.00 to 24.00

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

ported. The American Cast Iron Pipe Co. took 331 tons of 6 to 12-in. Class 150 pipe for Fullerton, Cal. Los Angeles placed 2679 tons as follows: 986 tons of 6, 8 and 12-in. Class 150 with the United States Pipe & Foundry Co., 931 tons of 6 and 8-in. with the American Cast Iron Pipe Co., 762 tons of 6-in. Class 150 pipe divided equally between the National Cast Iron Pipe Co. and the Pacific States Cast Iron Pipe Co. Eureka, Cal., rejected all bids on 100 tons of 16-in. Class 150 pipe. The only new inquiry calls for 105 tons of 4 to 8-in. Class B pipe for Anaheim, Cal.

### Steel Pipe

The Pacific Gas & Electric Co. has inquired for 40,000 ft. of 12-in. gas pipe, amounting to 250 tons. The Montana Power Co. plans a 250-mile line, calling for 62,000 tons. Standard steel pipe continues to move in limited lots.

### Plates

In addition to the 10,000-ton Seattle pipe line, taken by the Western Pipe & Steel Co., there was an award of 700 tons for a 36-in. welded steel pipe line for Spokane, Wash., to the Steel Tank & Pipe Co. Another fabricator booked 450 tons for a pipe line project in California. San Francisco will open bids Oct. 29 on about 5000 tons of plates for a 36 and 44-in. welded, riveted or lock-bar pipe line. On Oct. 27 Los Angeles will receive bids on 1700 tons for a 38 to 54-in. welded pipe line. The price range continues at 2.05c. to 2.15c., c.i.f.

## BUFFALO

Pig Iron Sales About 6000 Tons—Steel  
Plant Operations Unchanged

BUFFALO, Oct. 28.—Pig iron sales of approximately 6000 tons in the week were made up of orders up to 200 and 300 tons each. All business is for prompt shipment.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	\$17.50
No. 2X fdy., sil. 2.25 to 2.75	18.00
No. 1 fdy., sil. 2.75 to 3.25	19.00
Malleable, sil. up to 2.25	18.00
Basic	17.50
Lake Superior charcoal	27.28

### Finished Steel

Operations of Buffalo mills are unchanged. The Lackawanna plant of the Bethlehem Steel Co. continues to operate 15 of 24 open-hearths. The

Donner plant of the Republic Steel Corp. is operating four open-hearths. Wickwire-Spencer is operating two and Gould Coupler one. There appears to be a better volume of small structural orders, but only one sizable tonnage has been placed—350 tons for a factory building at Yonkers, N. Y. Structural steel fabricators report severe price competition on all business taken.

### Old Material

The sale of 5000 tons of No. 1 and No. 2 heavy melting steel noted last week has developed into a sale of

## Warehouse Prices, f.o.b. Buffalo

	Base per lb.
Plates and struc. shapes.....	3.25c.
Soft steel bars.....	3.15c.
Reinforcing bars.....	3.95c.
Cold-fin. flats and sq.....	3.65c.
Rounds and hex.....	3.15c.
Cold-rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.20c.
Galv. sheets (No. 24).....	4.60c.
Bands.....	3.50c.
Hoops.....	3.90c.
Blue ann'd sheets (No. 10).....	3.50c.
Com. wire nails, base per keg.....	\$2.60
Black wire, base per 100 lb.....	3.20

10,000 tons. This is virtually the only item of interest in the local market. A few sales of stove plate at around \$10 are noted, but these are small and have little bearing on the market. Yard dealers are not busy, and there is no element of speculation in the market in regard to the storing of scrap.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel.....	\$12.50	
No. 2 heavy melting scrap.....	11.00	
Scrap rails.....	\$12.00 to 12.50	
Hydraul. comp. sheets.....	10.50 to 11.00	
Hand bundled sheets.....	8.00 to 8.50	
Drop forge flashings.....	10.50 to 11.00	
No. 1 busheling.....	10.50 to 11.00	
Hvy. steel axle turnings.....	11.00 to 11.50	
Machine shop turnings.....	6.00 to 7.00	
No. 1 railroad wrought.....	10.00 to 10.50	
Acid Open-Hearth Grades:		
Knuckles and couplers.....	14.50 to 15.00	
Coil and leaf springs.....	14.50 to 15.00	
Rolled steel wheels.....	14.50 to 15.00	
Low phos. billet and bloom ends.....	15.50 to 16.00	
Electric Furnace Grades:		
Short shov. steel turnings.....	9.75 to 10.25	
Blast Furnace Grades:		
Short mixed borings and turnings.....	8.00 to 8.50	
Cast iron borings.....	8.00 to 8.50	
No. 2 busheling.....	7.00	
Rolling Mill Grades:		
Steel car axles.....	15.00 to 15.50	
Iron axles.....	19.00 to 19.50	
Cupola Grades:		
No. 1 machinery cast.....	11.00 to 11.50	
Stove plate.....	10.00 to 10.50	
Locomotive grate bars.....	8.25 to 9.25	
Steel rails, 3 ft. and under.....	15.00 to 15.50	
Cast iron carwheels.....	13.50 to 14.00	
Malleable Grades:		
Industrial.....	14.00 to 14.50	
Railroad.....	14.00 to 14.50	
Agricultural.....	14.00 to 14.50	
Special Grades:		
Chemical borings.....	11.50 to 12.00	

## Scrap Declines Further at Detroit

DETROIT, Oct. 28.—Heavy melting steel and other scrap items declined further the past week. The scrap market is listless, with many consumers holding up shipments on current contracts. Local dealers look for still lower prices in the immediate future.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel.....	\$10.00 to \$10.50
Borings and short turnings.....	4.50 to 5.00
Long turnings.....	4.00 to 4.50
No. 1 machinery cast.....	10.00 to 10.50
Automotive cast.....	12.00 to 12.50
Hydraul. comp. sheets.....	10.00 to 10.50
Stove plate.....	7.50 to 8.00
New No. 1 busheling.....	8.75 to 9.25
Old No. 2 busheling.....	4.25 to 4.75
Sheet clippings.....	7.25 to 7.75
Flashings.....	9.25 to 9.75

## CINCINNATI

Pig Iron Demand Shows No Improvement—Scrap Market Stagnant

CINCINNATI, Oct. 28.—Reflecting the continued low melt in this district, demand for pig iron has shown virtually no improvement. The listlessness of buyers is contrasted with the sales activity on the part of furnace representatives, which, however, is not producing increased purchasing. Sales in the week were about 2110 tons, all for spot shipment except two orders. One central Ohio buyer took 300 tons of Northern foundry iron and another took 100 tons of Southern. District foundries continue to operate a few heats a week, while others hold production to three or four days a week.

Prices per gross ton, deliv'd Cincinnati: So. Ohio fdy., sil. 1.75 to 2.25.....\$20.89 to \$21.39 Ala. fdy., sil. 1.75 to 2.25.. 15.19 to 16.19 Ala. fdy., sil. 2.25 to 2.75.. 15.69 to 16.69 Tenn. fdy., sil. 1.75 to 2.25. 15.19 to 16.19 S'th'n Ohio silvery, 8 per cent..... 24.39

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

## Finished Steel

While a slight increase in bookings of sheets was noted last week, this was not sufficient to warrant an increase in mill schedules.

## Coke

Shipments of foundry grades of coke during October were below the level of September, and early specifications for November indicate no improvement. Prices on by-product foundry coke continue at about \$9, delivered in Cincinnati.

## Warehouse Prices, f.o.b. Cincinnati

	Base per lb.
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
New billet reforc. bars.....	3.15c.
Rail steel reforc. bars.....	3.00c.
Hoops.....	3.90c.
Bands.....	3.35c.
Cold-fin. rounds and hex.....	3.80c.
Squares.....	4.30c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue ann'd sheets (No. 10).....	3.45c.
Structural rivets.....	4.20c.
Small rivets.....	60 per cent off list
No. 9 ann'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg (25 kegs or more).....	2.95
Cement c't'd nails, base 100 lb. keg.....	2.95
Chain, per 100 lb.....	10.25
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.....	\$16.50
4-in.....	34.50
Seamless steel boiler tubes, 2-in.....	17.50
4-in.....	36.00

## Old Material

Demand for scrap is slow. Prices remain steady, since there is nothing to test them.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$10.25 to \$10.75
Scrap rails for melting.....	11.50 to 12.00
Loose sheet clippings.....	6.75 to 7.25
Bundled sheets.....	9.25 to 9.75
Cast iron borings.....	6.00 to 6.50
Machine shop turnings.....	6.00 to 6.50
No. 1 busheling.....	8.50 to 9.00
No. 2 busheling.....	6.00 to 6.50
Rails for rolling.....	12.50 to 13.00
No. 1 locomotive tires.....	13.00 to 13.50
No. 2 railroad wrought.....	10.25 to 10.75
Short rails.....	15.75 to 16.25
Cast iron carwheels.....	12.00 to 12.50
No. 1 machinery cast.....	14.50 to 15.00
No. 1 railroad cast.....	12.50 to 13.00
Burnt cast.....	7.00 to 7.50
Stove plate.....	7.00 to 7.50
Brake shoes.....	7.00 to 7.50
Agricultural malleable.....	12.50 to 13.00
Railroad malleable.....	13.50 to 14.00

## BIRMINGHAM

Steel Bookings Show Gains—Pig Iron Shipments Slightly Higher

BIRMINGHAM, Oct. 28.—Through quiet buying at different times this month a fair number of large melters of pig iron in this district have covered their November requirements and several have bought through December. Spot buying, dictated by actual melt requirements, is holding its own. A drop in shipping specifications is reported for the past two or three days, but so far this month shipments have been running slightly ahead of the September rate. Sales for district delivery continue at \$14, base Birmingham.

Ten furnaces have been active for the past four weeks. Of this number, eight are on foundry iron and two on basic iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.....	\$14.00
No. 1 fdy., 2.25 to 2.75 sil.....	14.50
Basic.....	14.00

## Finished Steel

One of the larger companies reports better bookings last week than in any of the preceding 10 weeks.

Another reports a noticeable gain in bookings along with increased specifications on contracts. Sales so far this month are reported ahead of those for the comparable period in September. One large company has stepped up operations at certain of its finishing mill units.

The Tennessee company is using five of its eight open-hearth at Fairfield, an increase of one. All nine open-hearth at Ensley are still on the idle list. The Gulf States Steel Co. has three open-hearth active out of its six at Alabama City.

Structural steel fabricators still find it difficult to close on tonnages up for figures, and backlogs are declining. The only sizable order reported last week was 380 tons booked by the Virginia Bridge & Iron Co. for a new fabricating unit at the Birmingham plant of the Chicago Bridge & Iron Works.

## Cast Iron Pipe

The outlook for the next 30 days has taken a turn for the better as



several cities rush plans for completing construction programs before the winter season. Detroit and St. Louis are reported among the cities planning to buy pipe at an early date. Awards pending for this week include 800 to 900 tons for Marrero, La., to be let Oct. 30, and three miles of 8 or 10-in. pipe for Orange, Va., on which bids are to be opened today. The American Cast Iron Pipe Co. has booked 400 tons for Fullerton, Cal., and the McWane Cast Iron Pipe Co. has received a contract for 600 tons for Hamilton County, Ohio. Yard stocks are reported to have increased some during the past 10 days, while operations remained fairly steady. Quotations are unchanged from \$37 to \$38 a ton, Birmingham.

### Coke

Specifications for foundry coke are about the same as for the past few weeks, the rate being far below normal for this season. Active ovens

continue at 912 of 1390. This is the lowest rate of operations in several years.

### Old Material

Many of the larger users remain out of the market, and there are no indications that they will reenter it soon. Dealers have lowered quotations on some lines by estimating the values in the absence of any buying that might serve as a base for price alignment. On grades in which there is any trading the published quotations continue to hold.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	.....\$10.00 to \$11.00
Scrap steel rails	.....12.50
Short shoveling turnings	.....9.25
Cast iron borings	.....9.00
Stove plate	.....9.50
Steel axles	.....20.50 to 21.00
Iron axles	.....21.00
No. 1 railroad wrought	.....10.00
Rails for rolling	.....11.50 to 12.00
No. 1 cast	.....11.50
Tramcar wheels	.....13.50
Cast iron borings, chem.	.....13.50
Cast iron carwheels	.....11.00

## CANADA Large Rail Orders Expected Soon—Business Generally Unimproved

TORONTO, Oct. 28.—While there appears to be some indications of early improvement in the iron and steel industry of Canada, the various industries coming under this head have done little toward stepping up production. Both the Canadian National and Canadian Pacific railway companies have announced extensive building and construction programs on which work will be started almost immediately. In this connection large tonnages of steel rails will be required, awards of which are expected during the last two months of the year. It has just been announced that the Canadian National has decided to replace the 80-lb. rails between Kamloops and Jasper Park in British Columbia with 100-lb. steel.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil.	2.25 to 2.75.....\$22.60
No. 2 fdy., sil.	1.75 to 2.25.....22.10
Malleable	.....22.60

Delivered Montreal	
No. 1 fdy., sil.	2.25 to 2.75.....\$24.00
No. 2 fdy., sil.	1.75 to 2.25.....23.50
Malleable	.....24.00
Basic	.....22.50

### Pig Iron

The demand for merchant pig iron has again fallen into a slump. New business is slow, as melters are interested in immediate needs only. No large contracts have been booked during the past week or 10 days either for spot or future delivery. Inquiries do not point to heavy buying in the early future. Prices are unchanged.

### Old Material

Business is practically at a standstill. Local dealers state that there is no demand for steel turnings, and the demand for heavy melting steel is

confined to small tonnage lots. Some shipments of steel are going to the Hamilton district, but otherwise there is no movement in Ontario. Dealers' buying prices are unchanged.

Dealers' buying prices for old material:  
Per Gross Ton

	Toronto	Montreal
Heavy melting steel	.....\$7.00	\$6.00
Rails, scrap	.....7.00	6.00
No. 1 wrought	.....6.00	8.00
Machine shop turnings	.....2.00	2.00
Boiler plate	.....5.00	4.50
Heavy axle turnings	.....2.50	2.50
Cast borings	.....2.00	2.00
Steel borings	.....2.00	2.00
Wrought pipe	.....2.00	2.00
Steel axles	.....7.00	9.00
Axles, wrought iron	.....7.00	11.00
No. 1 machinery cast	.....10.00	10.00
Stove plate	.....8.00	8.00
Standard carwheels	.....8.50	8.50
Malleable	.....8.00	8.00

Per Net Ton

No. 1 mach'y cast	.....11.00	.....
Stove plate	.....9.00	.....
Standard carwheels	.....10.00	.....
Malleable scrap	.....9.00	.....

## Hoover Dam Will Require 46,690 Tons Iron and Steel

WASHINGTON, Oct. 28.—Iron and steel requirements for construction of the Hoover (Boulder) dam will total about 48,690 gross tons, according to estimates prepared by the Bureau of Reclamation, Department of the Interior, which has charge of the project. The largest steel item will be reinforcing bars, estimated at 8382 tons. Other estimates are: Structural steel, 4026 tons; 6-ft. 9-in. cast iron pipe lining, 4288 tons; steel penstocks, 6300 tons; steel pipe, 3360 tons; pumping and piping, 5865 tons; miscellaneous metal work, 7702 tons; high pressure gates, 5536 tons; balanced needle valves, 1964 tons, and cylinder gates, 1267 tons.

Machinery and equipment to be in-

stalled will cost about \$17,700,000. Tentative plans for a 1,000,000 hp. installation call for 12 85,000-hp. hydraulic turbines, 12 11x10-ft. balanced valves, 12 75,000 kv.-amp. generators with exciters, 36 25,000 kv.-amp. 220,000-volt transformers, four 250-ton cranes, switchboard and control apparatus, completely equipped machine shop.

Bids will be asked directly by the bureau. It now seems probable that bids for construction of diversion tunnels and dams will be asked about June, 1931, and that at approximately the same time bids will be asked for steel and other material.

Specifications are obtainable at the bureau in Washington, Elwood Mead, commissioner; Bureau of Reclamation, Wilda Building, Denver, Colo., R. F. Walter, chief engineer, or Bureau of Reclamation, Las Vegas, Nev., Walker R. Young, construction engineer.

The dam is to be built in the upper Black canyon on the Colorado river, about 30 miles southeast of Las Vegas on the Arizona-Nevada State lines.

## Navy Department to Sell 50 Destroyers As Scrap

WASHINGTON, Oct. 28.—Approximately 13,726 gross tons of scrap will be recovered from 50 American Navy destroyers which will be dismantled soon in compliance with the terms of the London treaty. Nineteen of the vessels will be disposed of at Philadelphia and 31 at the Mare Island Navy Yard. All but about 2300 tons will be ferrous metal. The largest item, about 4000 tons, will be heavy material, largely plates and shapes. Among the non-ferrous items will be about 720 tons of copper tubing. The boilers and main propelling machinery and such of the pumps and auxiliary machinery as are worn beyond economical repair will be cut up for scrap and are included in the total estimate.

Rear Admiral John Halligan, acting chief of naval operations, has informed THE IRON AGE that in order to perform the salvaging operations with the greatest return to the Government, two methods are under consideration. One calls for removal of material to be salvaged and cutting up by the navy yards, to be sold as scrap metal. The other provides for the sale of the vessel "as is," to be cut up and dismantled by the purchaser. Five vessels are being handled by the first method and six by the second at the Mare Island yard. When returns are available for comparison, the Navy Department intends to choose the method bringing the greatest return to the Government for disposal of the remaining vessels.

In addition to the 50 destroyers to be salvaged soon, two more are reserved for special experimental work at the Norfolk, Va., yard and nine are reserved on the West Coast.

# ▲▲ Semi-Finished Steel, Raw Materials, Bolts and Rivets ▲▲

## Mill Prices of Semi-Finished Steel

Billets and Blooms	
	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	\$31.00
Rerolling, 4-in. and under 10-in., Youngstown	31.00
Rerolling, 4-in. and under 10-in., Cleveland	31.00
Rerolling, 4-in. and under 10-in., Chicago	32.00
Forging quality, Pittsburgh	36.00

Sheet Bars	
(Open Hearth or Bessemer)	Per Gross Ton
Pittsburgh	\$31.00
Youngstown	31.00
Cleveland	31.00

Slabs	
(8 in. x 2 in. and under 10 in. x 10 in.)	Per Gross Ton
Pittsburgh	\$31.00
Youngstown	31.00
Cleveland	31.00

Skelp	
(F.o.b. Pittsburgh or Youngstown)	Per Lb.
Grooved	1.60c. to 1.70c.
Universal	1.60c. to 1.70c.
Sheared	1.60c. to 1.70c.

Wire Rods	
(Common soft, base)	Per Gross Ton
Pittsburgh	\$36.00
Cleveland	36.00
Chicago	37.00

## Prices of Raw Material

Ores	
Lake Superior Ores, Delivered Lower Lake Ports	Per Gross Ton
Old range Bessemer, 51.50% iron	\$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40
Foreign Ore, c.i.f. Philadelphia or Baltimore	
Per Unit	
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	11c.
Iron ore, basic Swedish, average 65% iron	9c.
Manganese ore, washed 52% manganese, from the Caucasus	26c. to 28c.
Manganese ore, Brazilian, African or Indian, basic 50%	26c. to 28c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$12.00 to \$14.00
Per Gross Ton	
Chrome ore, 45 to 50% Cr <sub>2</sub> O <sub>3</sub> crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00
Per Lb.	
Molybdenum ore, 85% concentrates of MoS <sub>2</sub> delivered	50c. to 55c.

Ferromanganese	
	Per Gross Ton
Domestic, 80%, seaboard	\$94.00 to \$99.00
Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00

Spiegeleisen	
	Per Gross Ton Furnace
Domestic, 19 to 21%	\$31.00 to \$33.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon	
	Per Gross Ton Delivered
50%	\$83.50
75%	130.00

Per Gross Ton	Per Gross Ton
Furnace	Furnace
10%	\$35.00
11%	37.00
12%	39.00
14%	39.00

Bessemer Ferrosilicon	
F.o.b. Jackson County, Ohio, Furnace	Per Gross Ton
10%	\$26.50
11%	28.50
12%	30.50
13%	\$32.50
14%	34.50
15%	37.00

Silvery Iron	
F.o.b. Jackson County, Ohio, Furnace	Per Gross Ton
6%	\$21.00
7%	21.50
8%	22.00
9%	22.50
10%	23.00
11%	\$24.00
12%	25.00
13%	27.00
14%	29.00
15%	31.00

Delivered prices at Chicago are about 50c. a ton below this schedule.

Other Ferroalloys	
Ferrotungsten, per lb. contained metal del'd	\$1.30 to \$1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	\$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	\$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	\$122.50

Fluxes and Refractories	
Fluorspar	
	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	\$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	\$17.00 to \$17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick	
Per 1000 f.o.b. Works	
High-Heat	Intermediate
Duty Brick	Heavy Duty Brick
Pennsylvania	\$43.00 to \$46.00
Maryland	43.00 to 46.00
New Jersey	50.00 to 65.00
Ohio	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Illinois	43.00 to 46.00
Ground fire clay, per ton	7.00

Silica Brick	
Per 1000 f.o.b. Works	
Pennsylvania	\$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	\$8.50 to 10.00

Magnesite Brick	
Per Net Ton	
Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick	
Per Net Ton	
Standard size	\$45.00

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	Per Cent Off List
Machine bolts	73
Carriage bolts	73
Lag bolts	73
Plow bolts, Nos. 1, 2, 3 and 7 heads	73
Hot-pressed nuts, blank or tapped, square	73
Hot-pressed nuts, blank or tapped, hexagons	73
C.p.c. and t. square or hex. nuts, blank or tapped	73
Washers*	7.00c. to 6.75c. per lb. off list

\*F.o.b. Chicago, New York and Pittsburgh.  
 †Bolts with rolled thread up to and including 3/8 in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts	
Semi-finished hexagon nuts	Per Cent Off List
Semi-finished hexagon castellated nuts, S.A.E.	73
Stove bolts in packages, P'gh.	80, 10, 10 and 5
Stove bolts in packages, Chicago	80, 10, 10 and 5
Stove bolts in packages, Cleveland	80, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 5 and 2 1/2
Stove bolts in bulk, Chicago	80, 10, 10, 5 and 2 1/2
Stove bolts in bulk, Cleveland	80, 10, 10, 5 and 2 1/2
Tire bolts	60, 10 and 10

Discounts of 73 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets	
(1/2-in. and larger)	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	\$2.75
F.o.b. Chicago	2.85

Small Rivets	
(3/8-in. and smaller)	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws	
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	.75 and 10
Upset hex. head cap screws, U.S.S. thread	85 and 10
Upset hex. cap screws, S.A.E. thread	.85 and 10
Upset set screws	80, 10 and 5
Milled studs	70



# ▲▲▲ Mill Prices of Finished Iron and Steel Products ▲▲▲

## Iron and Steel Bars

Soft Steel	
	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c. to 1.65c.
F.o.b. Chicago.....	1.70c.
Del'd Philadelphia.....	1.89c. to 1.94c.
Del'd New York.....	1.93c. to 1.98c.
F.o.b. Cleveland.....	1.60c. to 1.65c.
F.o.b. Lackawanna.....	1.70c. to 1.75c.
F.o.b. Birmingham.....	1.80c.
C.i.f. Pacific ports.....	2.10c.
F.o.b. San Francisco mills.....	2.25c.

Billet Steel Reinforcing	
F.o.b. P'gh mills, 40, 50, 60-ft.....	1.70c. to 1.75c.
F.o.b. Birmingham, mill lengths.....	1.80c.

Rail Steel	
F.o.b. mills, east of Chicago dist.....	1.55c.
F.o.b. Chicago Heights mill.....	1.65c.
Del'd Philadelphia.....	1.84c. to 1.89c.

Iron	
Common iron, f.o.b. Chicago.....	1.70c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.09c.
Common iron, del'd New York.....	2.14c.

## Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c.
F.o.b. Chicago.....	1.70c. to 1.75c.
F.o.b. Birmingham.....	1.80c.
Del'd Cleveland.....	1.78½c.
Del'd Philadelphia.....	1.80½c. to 1.85½c.
F.o.b. Coatesville.....	1.70c.
F.o.b. Sparrows Point.....	1.70c.
F.o.b. Lackawanna.....	1.70c.
Del'd New York.....	1.88c.
C.i.f. Pacific ports.....	2.05c. to 2.15c.

## Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c.
F.o.b. Chicago.....	1.70c. to 1.75c.
F.o.b. Birmingham.....	1.80c.
F.o.b. Lackawanna.....	1.70c. to 1.75c.
F.o.b. Bethlehem.....	1.70c.
Del'd Cleveland.....	1.78½c.
Del'd Philadelphia.....	1.71c. to 1.76c.
Del'd New York.....	1.85½c.
C.i.f. Pacific ports.....	2.15c. to 2.25c.

## Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh.....	1.70c.
Wider than 6 in., P'gh.....	1.60c.
6 in. and narrower, Chicago.....	1.80c.
Wider than 6 in., Chicago.....	1.70c.
Cooperage stock, P'gh.....	1.90c. to 2.00c.
Cooperage stock, Chicago.....	2.00c. to 2.10c.

## Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.10c.
Bars, f.o.b. Chicago.....	2.10c.
Bars, Cleveland.....	2.10c.
Bars, Buffalo.....	2.10c.
Shafting, ground, f.o.b. mill.....	*2.45c. to 3.40c.
Strips, P'gh.....	2.35c. to 2.45c.
Strips, Cleveland.....	2.35c. to 2.45c.
Strips, deliv'd Chicago.....	2.63c.
Strips, Worcester.....	2.50c. to 2.60c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland.....	3.60c.

\*According to size.

## Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)	
To Merchant Trade	
	Base per Keg
Standard wire nails.....	\$1.95 to \$2.00
Cement coated nails.....	1.95 to 2.00
Galvanized nails.....	3.95 to 4.05

	Base per Lb.
Polished staples.....	2.40c. to 2.50c.
Galvanized staples.....	2.65c. to 2.75c.
Barbed wire, galvanized.....	2.60c. to 2.70c.
Annealed fence wire.....	2.10c. to 2.20c.
Galvanized wire, No. 9.....	2.55c. to 2.65c.
Woven wire fence (per net ton to re-tailers).....	\$65.00

## To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage.....	2.30c.
Spring wire.....	3.30c.
(Carload lots, f.o.b. Chicago)	
Wire nails.....	\$2.05 to \$2.10
Annealed fence wire.....	2.40c. to 2.50c. (lb.)
Bright hard wire to manufacturing trade.....	2.35c.

Anderson, Ind., mill prices are ordinarily \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

## Light Plates

	Base per Lb.
No. 10, blue annealed, f.o.b. P'gh.....	1.90c. to 2.00c.
No. 10, blue annealed, f.o.b. Chicago dist.....	2.10c.
No. 10, blue annealed, del'd Phila.....	2.32c. to 2.42c.
No. 10, blue annealed, B'ham.....	2.15c.

## Sheets

Blue Annealed	
	Base per Lb.
No. 13, f.o.b. P'gh.....	2.05c. to 2.15c.
No. 13, f.o.b. Chicago dist.....	2.25c.
No. 13, del'd Philadelphia.....	2.34c. to 2.44c.
No. 13, blue annealed, B'ham.....	2.30c.

Box Annealed, One Pass Cold Rolled	
No. 24, f.o.b. Pittsburgh.....	2.35c. to 2.45c.
No. 24, f.o.b. Chicago dist. mill.....	2.45c. to 2.55c.
No. 24, del'd Philadelphia.....	2.64c. to 2.74c.
No. 24, f.o.b. Birmingham.....	2.60c.

## Steel Furniture Sheets

No. 24, f.o.b. P'gh.....	3.60c.
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Galvanized	
No. 24, f.o.b. Pittsburgh.....	3.00c.
No. 24, f.o.b. Chicago dist. mill.....	3.10c. to 3.20c.
No. 24, del'd Cleveland.....	3.18½c. to 3.28½c.
No. 24, del'd Philadelphia.....	3.24c. to 3.29c.
No. 24, f.o.b. Birmingham.....	3.15c.

## Continuous Mill Sheets

No. 10 gage.....	1.75c. to 1.80c.
No. 13 gage.....	1.90c. to 1.95c.

## Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.70c.
No. 28, f.o.b. Chicago dist. mill.....	2.80c.

## Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	3.40c. to 3.50c.
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## Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	3.45c. to 3.55c.
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## Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh.....	3.70c.
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## Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.00
Standard cokes, f.o.b. Gary.....	5.10

## Terne Plate

(F.o.b. Morgantown or Pittsburgh)	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C. \$10.30	25-lb. coating I.C. \$15.20
15-lb. coating I.C. 12.90	30-lb. coating I.C. 16.00
20-lb. coating I.C. 14.00	40-lb. coating I.C. 17.80

## Alloy Steel Bars

(F.o.b. maker's mill)	
Alloy Quantity Bar Base, 2.65c. per Lb.	
S.A.E. Series	Alloy Differential

2000 (½% Nickel).....	\$0.25
2100 (1¼% Nickel).....	0.55
2300 (3¼% Nickel).....	1.50
2500 (5% Nickel).....	2.25
3100 Nickel Chromium.....	0.55
3200 Nickel Chromium.....	1.35
3300 Nickel Chromium.....	3.80
3400 Nickel Chromium.....	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45
5100 Chromium Spring Steel.....	0.20
6100 Chromium Vanadium Bar.....	1.20
6100 Chromium Vanadium Spring Steel.....	0.95
9250 Silicon Manganese Spring Steel (flats).....	0.25
Rounds and squares.....	0.50
Chromium Nickel Vanadium.....	1.50
Carbon Vanadium.....	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¼c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

## Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	34.00
Light (from rail steel), f.o.b. mill.....	32.00
Light (from billets), f.o.b. Ch'go mill.....	36.00

## Track Equipment

	Base per 100 Lb.
Spikes, ¾ in. and larger.....	\$2.80
Spikes, ½ in. and smaller.....	2.80

Spikes, boat and barge.....	\$3.00
Tie plate, steel.....	2.07½
Angle bars.....	2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	.73 per cent off list

## Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld	
Steel	Iron
Inches	Black Galv.
1½.....	47 21½ ¼ and ¾ +11 +36
1½ to 3.....	53 27½ ¼..... 23 5
1½.....	58 44½ ¾..... 28 11
¾.....	62 50½ 1 and 1½ 31 15
1 to 3.....	64 52½ 1½ and 2 35 18

## Lap Weld

2.....	57 45½ 2..... 23 9
2½ to 6.....	61 49½ 2½ to 3½ 28 13
7 and 8.....	58 45½ 4 to 6..... 30 17
9 and 10.....	56 43½ 7 and 8..... 29 16
11 and 12.....	55 42½ 9 to 12..... 26 11

## Butt Weld, extra strong, plain ends

¾.....	43 26½ ¼ and ¾ +13 +48
1½ to ¾.....	49 32½ ¼..... 23 7
¾.....	55 44½ ¾..... 28 12
¾.....	60 49½ 1 to 2..... 34 18
1 to 1½.....	62 51½
2 to 3.....	63 52½

## Lap weld, extra strong, plain ends

2.....	55 44½ 2..... 29 13
2½ to 4.....	59 48½ 2½ to 4..... 34 20
4½ to 6.....	58 47½ 4½ to 6..... 33 19
7 to 8.....	54 41½ 7 and 8..... 31 17
9 and 10.....	47 34½ 9 to 12..... 21 8
11 and 12.....	46 33½

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discount of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel	
2 in. and 2½ in.	Charcoal Iron
38.....	1½ in. .... 1
46.....	1¾ in. .... 8
52.....	2 in.—2½ in. .... 13
54.....	2½ in.—3 in. .... 16
57.....	3 in.—3½ in. .... 17
46.....	3½ in. to 3¾ in. .... 18
	4 in. .... 20
	4½ in. .... 21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

## Standard Commercial Seamless Boiler Tubes

Cold Drawn	
1 in. ....	61
1¼ to 1½ in. ....	53
1¾ in. ....	37
2 to 2½ in. ....	32
2½ to 3 in. ....	40
3 in. ....	52
3½ to 3¾ in. ....	48
4 in. ....	51
4½, 5 and 6 in. ....	40

## Hot Rolled

2 and 2½ in. ....	38
2½ and 3 in. ....	46
3 in. ....	52
3½ to 3¾ in. ....	54
4 in. ....	57
4½, 5 and 6 in. ....	46

Beyond the above base discount a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

Per Cent Off List	
Carbon, 0.10% to 0.30% base (carloads).....	55
Carbon, 0.30% to 0.40% base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

## Reinforcing Steel

Lettings of 6500 Tons—New Projects 5800 Tons

**R**EINFORCING steel awards the past week, at 6500 tons, were slightly higher than those of a week ago. With the exception of 1750 tons for the New York water tunnel No. 2, from Yonkers to Brooklyn, lettings ranged from 100 to 650 tons. New inquiries call for 5800 tons and include 1700 tons for an office building for the House of Representatives, Washington. Awards follow:

NEW YORK, 210 tons, Institute for Crippled and Disabled Children, to Jones & Laughlin Steel Corporation.  
NEW YORK, 1750 tons of square twisted bars for New York water tunnel No. 2, from Yonkers to Brooklyn; placed by Patrick McGovern, Inc., New York, with Pittsburgh Screw & Bolt Corpn.  
NEW YORK, 400 tons of steel furring for Waldorf-Astoria Hotel, to Republic Metal Lath Materials Co.  
KINGS PARK, N. Y., 200 tons, State Hospital, to Concrete Steel Co.  
NEW PALTZ, N. Y., 100 tons, State school, to Truscon Steel Co.  
HARRISON, N. J., 160 tons, warehouse for Behrer & Co., Inc., to Kalman Steel Co.  
ERIE, PA., 600 tons, freight house for Pennsylvania Railroad, to Concrete Steel Co.  
CHICAGO, 200 tons, Chicago Avenue bridge across Des Plaines River, to Materials Service Corpn.  
COOK COUNTY, ILL., 300 tons, bridge, to an unnamed bidder.  
CHICAGO, 200 tons, public school, to Inland Steel Co.  
ST. LOUIS, 655 tons, *Globe-Democrat* building, to Laclede Steel Co.  
WOOD CITY, CAL., 200 tons, tanks for Portland Cement Co., to Pacific Steel Corpn.  
SAN FRANCISCO, 114 tons, Bank of Italy, to Pacific Coast Steel Corpn.  
SAN FRANCISCO, 450 tons, Mills Building, to Gunn, Carle & Co.  
PHOENIX, ARIZ., 140 tons, bridge on Flagstaff highway, to an unnamed bidder.  
TUCSON, ARIZ., 226 tons, culvert over arroyo, to an unnamed bidder.  
SEATTLE, 600 tons, Textile Towers, to Pacific Coast Steel Corpn.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BILLERICA, MASS., 200 tons, County Institution.  
PROVIDENCE, R. I., 300 tons, sewage disposal plant.  
JERSEY CITY, N. J., 500 tons, six-story garage building on Bergen Avenue; general contract placed with Fisher-Williams Corpn., New York.  
PORT IVORY, STATEN ISLAND, N. Y., 150 tons, plant building for Procter & Gamble Co.  
NEW YORK, 500 tons, eight-story warehouse and garage, West End Avenue, between Sixty-fourth and Sixty-fifth streets.  
NEW YORK, 1100 tons, subway route 108, section 6, Queens; general contract placed with George H. Flinn Corpn., New York.  
NEW YORK, 600 tons, subway route 108, section 9, Queens; bids close Nov. 20.  
YONKERS, N. Y., 135 tons, grade separation and bridge work; Aborio Construction Co., Poughkeepsie, N. Y., low bidder on general contract.

WASHINGTON, 1700 tons, House of Representatives office building.  
CINCINNATI, 4000 tons of bars, Western Hills viaduct; McDougal Construction Co., Atlanta, Ga., general contractor.  
CHICAGO, 800 tons, Wendell Phillips High School.  
CHICAGO, 100 tons, Goldberg Store.  
TECHNY, ILL., 150 tons, County highway bridge; Acme Construction Co. low bidder.  
ALGOA, MO., 300 tons, intermediate reformatory for State Prison Board.  
STATE OF MISSISSIPPI, 400 tons, highway work.

## Says Bethlehem May Change Bonus Per Cents

YOUNGSTOWN, Oct. 28. — That Charles M. Schwab, chairman of Bethlehem Steel Corp., will alter the Bethlehem bonus plan if the Sheet & Tube merger is consummated, was suggested today by F. H. Wood, Bethlehem attorney, who argued to Judge David G. Jenkins in defense of the merger.

"The bonus per cents may be changed at the first of any month," Mr. Wood said, "and there cannot be any presumption that they will continue if the merger is consummated. The system was revised when Bethlehem took Lackawanna in 1923."

Stating that Mr. Schwab fixed the per cents under which President Eugene G. Grace last year was paid \$1,623,000, he told the court that the Bethlehem directors have reserved the right to withdraw Schwab's power, and the stockholders have reserved the power to make such revisions as they may desire.

"Mr. Schwab has reached a certain conclusion about the bonus per cents based on present conditions," Mr. Wood continued. "If the merger goes through the bonus will be properly and rightfully administered."

## Pig Iron Imports Higher in September

Imports of pig iron into the United States in September are reported by the Department of Commerce at 10,330 gross tons. This is nearly 20 per cent above the August imports of 8747 tons, and is the highest figure since last May. It shows a drop of about 6 per cent, however, from September, 1929. In the nine months, incoming pig iron has been 90,387

tons, or a drop of 13 per cent compared with last year.

British India supplied more than 75 per cent of the September imports, compared with about 59 per cent a year earlier. For the nine months India has furnished above 75 per cent, compared with only 43 per cent in 1929. United Kingdom was in second position in September and for both the nine-month periods, with the Netherlands in third position in the nine-month periods, but exceeded by Belgium in September.

## Rustless Steel for France Booked by Republic

The Republic Steel Corp. has booked a large order for Enduro rustless steel for export to France for the manufacture of automobile lamp shells in that country. This is the first important export order to be placed for Enduro in this country since its production was begun on a large commercial basis some months ago. The material is manufactured by Republic under license from Krupp of Germany at its Central alloy plant at Massillon.

According to officials of the corporation, current sales of rustless and other alloy steels are showing definite improvement.

## Tin Can and Tinware Output Up in 1929

WASHINGTON, Oct. 21.—Reflecting an increase of 15 per cent, the total production of tin cans and other tinware by 235 establishments in 1929 was \$284,288,513, compared with \$247,132,963 reported by 236 producers in 1927, according to the Bureau of the Census. The 1929 total was made up as follows: Hole-top cans, including cans for condensed and evaporated milk, \$25,855,002; sanitary cans, \$125,983,625; general-line cans and packages, \$118,469,914; ice cream cans, \$1,188,818; milk cans, \$3,308,578; stamped tinware, \$4,229,157; other tinware, \$5,253,419.

Production of babbitt metal for sale in September was 1,730,269 lb., compared with 1,783,331 lb. in August, according to reports made to the Bureau of the Census by 21 companies.

UNITED STATES IMPORTS OF PIG IRON BY COUNTRIES  
(In Gross Tons)

	September		Nine Months Ended September	
	1930	1929	1930	1929
United Kingdom.....	1,589	651	8,739	31,838
British India.....	7,848	6,485	68,345	44,271
Germany.....	...	...	50	103
Netherlands.....	229	693	5,941	19,722
Canada.....	96	2,709	488	3,472
France.....	...	...	...	101
Belgium.....	515	...	615	184
Norway.....	53	420	2,834	1,861
Sweden.....	...	25	2,607	1,440
All others.....	...	30	768	602
Total.....	10,330	11,013	90,387	103,594



# ▲▲▲ Non-Ferrous Metal Markets ▲▲▲

**Copper at 9½ Cents—Tin  
Quiet—Lead Steady—  
Zinc Lower**

NEW YORK, Oct. 28.

## Copper

Electrolytic copper was sold at 9.50c., delivered in the Connecticut Valley, on Oct. 23, establishing another new low price. It is at least 35 years since the red metal sold at such low levels. The movement was started by one or two custom smelters and all producers soon followed suit. On Oct. 24, Copper Exporters, Inc., reduced its price from 10.30c. to 9.80c., c.i.f. usual European ports. The lower export price has acted as a strong incentive to foreign consumers and sales have been very large, the total for the month to date being about 45,000 tons, which compares with 28,000 up to Oct. 21 and with a total of 25,000 for all of September. In the last three days 11,000 tons was booked. Buying by domestic consumers is moderately active, with sales extending into the first quarter.

The question of curtailment of production is still the main factor and some uncertainties still exist as to how far this has gone. Some mining companies, which, as the price fell some weeks ago, increased their output to make both ends meet, have closed down. Certainly most of the producers cannot make a profit at present selling values of the metal. While a lower price is still possible, sentiment is better and a feeling that the bottom has been reached is stronger. Lake copper is also moderately active at 9.50c. to 9.62½c., delivered.

## Tin

With prices of Straits tin still advancing in London and with the market strong here, there has developed a natural condition in which buyers are remaining out of the market. At the lower levels two weeks ago, enough metal was apparently bought and consumers will not purchase on a rising market. London prices today were a little higher than a week ago, with spot standard quoted at £118 17s. 6d., future standard at £120 5s., and spot Straits at £124 7s. 6d. The Singapore price today was £125 7s. 6d. Stocks in warehouses in the United Kingdom on Saturday, Oct. 25, were 24,174 tons, a decrease of 349 tons for the week. Straits shipments to Oct. 25, inclusive, are given as 6993 tons. Indications are that this total for the month will not go much over 7000 tons, which contrasts with an estimate early in the month of 8000 tons.

## Lead

Consumer buying has quieted down

## THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Oct. 28	Oct. 27	Oct. 25	Oct. 24	Oct. 23	Oct. 22
Lake copper, New York.....	9.62½	9.62½	9.62½	9.62½	9.62½	10.12½
Electrolytic copper, N. Y.*.....	9.25	9.25	9.25	9.25	9.25	9.75
Straits tin, spot, N. Y.....	27.12½	27.12½	...	26.87½	26.75	27.25
Zinc, East St. Louis.....	3.95	3.95	3.95	3.95	3.95	4.00
Zinc, New York.....	4.30	4.30	4.30	4.30	4.30	4.35
Lead, East St. Louis.....	4.95	4.95	4.95	4.95	4.95	4.95
Lead, New York.....	5.10	5.10	5.10	5.10	5.10	5.10

\*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

and is confined to carload and small lots for the immediate needs of each consumer. It is estimated that only about 50 per cent of the November requirements has been covered. Prices are very firm at 4.95c., St. Louis, with the quotation of the leading interest at 5.10c., New York.

## Zinc

During the week considerable prime Western zinc has changed hands at 3.95c., East St. Louis, and the market range now stands at 3.95c. to 4c., depending on the seller. The New York price is 4.30c. to 4.35c. Demand is quite light.

There has been another decline in the price of ore, the quotation on Saturday, Oct. 25, having fallen \$1 per ton to \$26. Production is still high at 9000 tons for last week, with shipments only a little over 7400 tons, in-

creasing the surplus to an estimated total of 40,604 tons.

## Antimony

In a dull market, Chinese metal is quoted unchanged at 7.37½c., duty paid, New York, for all positions

## Nickel

The long-established prices still prevail, with wholesale lots of ingot nickel available at 35c. a lb., with shot nickel at 36c., and electrolytic nickel in cathodes at 35c.

## Aluminum

Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 22.90c. a lb., delivered.

## Non-Ferrous Metals at Chicago

CHICAGO, Oct. 28.—Prices, with the exception of copper, are holding in a

## New York, Chicago or Cleveland Warehouse

### Delivered Prices, Base per Lb.

High brass .....	16.50c.
Copper, hot rolled, base sizes.....	19.50c.
Copper, cold rolled, 14 oz. and heavier, base sizes.....	21.50c.
<b>Seamless Tubes—</b>	
Brass .....	21.50c.
Copper .....	21.75c.
Brass Rods .....	14.87½c.
Brazed Brass Tubes.....	24.12½c.

## New York Warehouse

### Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks .....	9.75c. to 10.25c.
Zinc sheets, open.....	10.75c. to 11.25c.

## Metals from New York Warehouse

### Delivered Prices, per Lb.

Tin, Straits pig.....	29.00c. to 30.00c.
Tin, bar .....	31.00c. to 32.00c.
Copper, Lake .....	11.25c.
Copper, electrolytic .....	11.00c.
Copper, casting .....	10.75c.
Zinc, slab .....	5.75c. to 6.75c.
Lead, American pig.....	6.00c. to 7.00c.
Lead, bar .....	8.00c. to 9.00c.
Antimony, Asiatic .....	10.00c. to 10.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure).....	24.00c. to 25.00c.
Alum. ingots, No. 12 alloys .....	23.00c. to 24.00c.
Babbitt metal, commercial grade .....	25.00c. to 35.00c.
Solder, ½ and ¼ .....	20.50c. to 21.50c.

## Metals from Cleveland Warehouse

### Delivered Prices, per Lb.

Tin, Straits pig.....	32.25c.
Tin, bar .....	34.25c.
Copper, Lake .....	11.13c.
Copper, electrolytic .....	11.13c.
Copper, casting .....	10.75c.
Zinc, slab .....	5.50c. to 5.75c.
Lead, American pig.....	5.75c. to 6.00c.
Lead, bar .....	8.50c.
Antimony, Asiatic .....	11.50c.
Babbitt metal, medium grade.....	15.25c.
Babbitt metal, high grade.....	36.00c.
Solder, ½ and ¼ .....	19.75c.

## Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (Prices quoted are nominal. Holders of metal are generally unwilling to part with stock at present low levels.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.75c.	8.50c.
Copper, hvy. and wire	7.25c.	8.25c.
Copper, light and bottoms .....	6.75c.	7.50c.
Brass, heavy .....	4.50c.	5.50c.
Brass, light .....	3.50c.	4.50c.
Hvy. machine composition .....	7.00c.	7.75c.
No. 1 yel. brass turnings .....	5.00c.	5.50c.
No. 1 red brass or compos. turnings..	6.25c.	7.25c.
Lead, heavy .....	3.75c.	4.25c.
Lead, tea .....	2.50c.	3.00c.
Zinc .....	2.25c.	2.75c.
Sheet aluminum .....	7.50c.	9.50c.
Cast aluminum .....	7.00c.	8.75c.

market which is gradually gaining in sales momentum. Quotations on old metals are steady and consumers' wants are light.

Prices per lb. in carload lots: Lake copper, 9.62½c.; tin, 27.75c.; lead, 5.05c.; zinc, 4.05c.; in less-than-carload lots, antimony, 8.50c. On old

metals we quote copper wire, crucible shapes and copper clips, 7.50c.; copper bottoms, 6.50c. to 7c.; red brass, 6.50c. to 7c.; yellow brass, 4.50c. to 5c.; lead pipe, 3.75c. to 4c.; zinc, 1.50c. to 1.75c.; pewter, No. 1, 15c.; tin-foil, 16c.; block tin, 22c.; aluminum, 6.50c. to 7c.; all being dealers' prices for less-than-carload lots.

## Fabricated Structural Steel

### New Projects of 53,000 Tons Include 25,000-Ton Post Office in Chicago—Awards Reach 40,000 Tons

NEW fabricated structural steel projects of 53,000 tons are the largest since the first week in September. A substantial part of this total is represented by 25,000 tons, estimated as the requirement for a Post Office in Chicago, 5000 tons of fabricated steel pipe in San Francisco, 2000 tons for a bridge at Lackawanna, N. Y., and 1550 tons in a Newark, N. J., apartment building.

Awards totaling 40,000 tons are slightly smaller than a week ago, but well up among the year's large totals. Included are 8000 tons in a building on West Forty-second Street, New York, for the McGraw-Hill Publishing Co., 5000 tons in a section of New York subway, and 10,000 tons for a fabricated steel pipe line in Seattle, Wash. Awards follow:

#### North Atlantic States

TYNGSBORO, MASS., 1200 tons, State bridge, to Boston Bridge Works, Inc.  
FITCHBURG, MASS., 500 tons, Simonds Saw & Steel Co. plant, to New England Structural Co.  
NEW YORK, 1350 tons, annex to *New York Times* building, to McClintic-Marshall Co.  
NEW YORK, 5100 tons, subway route 107, section 8, to American Bridge Co.  
NEW YORK, 2170 tons, apartment building, Eighty-fourth Street and Central Park West, to Hinkle Iron Works.  
NEW YORK, 8000 tons, building on West Forty-second Street for McGraw-Hill Publishing Co., reported to American Bridge Co.  
YONKERS, N. Y., 350 tons factory building, to Kellogg Structural Steel Co.  
PHILADELPHIA, 3000 tons, building for Girard Trust Co., to Bethlehem Steel Co.  
WEST WASHINGTON, PA., 675 tons, school, to Keystone Engineering Co.

#### The South

BIRMINGHAM, 380 tons, addition to fabricating plant of Chicago Bridge & Iron Works, to Virginia Bridge & Iron Co.

#### Central States

CHICAGO, 2500 tons, senior high school, to Gage Structural Steel Co., local.  
ST. PETER, MINN., 500 tons, bridge, to Minneapolis-Moline Power Implement Co.  
ROCHESTER, MINN., 110 tons, St. Mary's Hospital, to an unnamed bidder.  
MILWAUKEE, 320 tons, addition to sewage plant, to Milwaukee Bridge Co.  
WAUKESHA, WIS., 150 tons, Spring City Foundry Co., to A. C. Woods & Co., Rockford, Ill.  
KANSAS CITY, MO., 1010 tons, Oak Street viaduct, to McClintic-Marshall Co.  
KANSAS CITY, MO., 650 tons, New England National Bank, to Kansas City Structural Steel Co.

#### Western States

SALINAS, CAL., 300 tons, steel poles for Pacific Gas & Electric Co., to Pacific Coast Steel Corpn.  
HEWETT, CAL., 103 tons, Valle Vista bridge, to McClintic-Marshall Co.  
CALIPATRIA, CAL., 500 tons, steel poles for

Southern Sierras Power Co., to Pacific Coast Steel Corpn.

SAN FRANCISCO, 450 tons, plates, pipe line for San Francisco, to an unnamed bidder.

SPOKANE, WASH., 700 tons, plates, 36-in. pipe line, to Steel Tank & Pipe Co.

SEATTLE, 10,000 tons, plates, pipe line, to Western Pipe & Steel Co.

#### Canada

FORT GARRY, MAN., 400 tons, new building for University of Manitoba, to Dominion Bridge Co.

#### STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

#### North Atlantic States

BILLERICA, MASS., 300 tons, House of Correction.  
ATTLEBORO, MASS., 125 tons, State bridge.  
PAWTUCKET, R. I., 106 tons, Post Office.  
FALL RIVER, MASS., 100 tons, Post Office.  
NEW YORK, 700 tons, apartment building at 400 East Fifty-second Street.  
NEW YORK, 200 tons, building for St. Raymond's Rectory, Castle Hill and Tremont Avenue, Borough of Bronx.  
NEW YORK, 200 tons, Brothers' residence, Church of St. John the Baptist, 194 East Seventy-sixth Street.  
NEW YORK, 1500 tons, Earl Carroll Theater, Seventh Avenue and Fiftieth Street.  
NEW YORK, 1200 tons, public schools, No. 24 about 400 tons and No. 150, about 800 tons, Borough of Queens.  
NEW YORK, 100 tons, factory at Port Ivory, Staten Island, for Procter & Gamble Co.  
NEW YORK, unstated tonnage, Medical Chambers Building, East Fifty-fourth Street.  
NEW YORK, 1200 tons, garage at Fifty-second Street and Twelfth Avenue.  
NEWARK, N. J., 1550 tons, Ironbound Apartments for Prudential Life Insurance Co.  
IRVINGTON, N. Y., 400 tons, hospital building.  
HACKENSACK, N. J., unstated tonnage, Fox Theater.  
NEW BRUNSWICK, N. J., 1000 tons, gymnasium for Rutgers College.  
PHILADELPHIA, 250 tons, office building at

2300 North Broad Street for Electric Realty Corporation; United Engineers & Constructors, Inc., general contractor.  
POCONO, PA., 400 tons, Pocono Towers Hotel.

WASHINGTON, 500 tons, four buildings for Theodore Roosevelt High School.

LACKAWANNA, N. Y., 2000 tons, Ridge Road bridge.

PITTSBURGH, 660 tons, West End North Side bridge over Ohio River; American Bridge Co., low bidder.

#### The South

HENDERSON, KY., 2600 tons, bridge.

CHARLOTTE, N. C., 1600 tons, Independence Hotel.

#### Central States

CLEVELAND, 100 tons, additional steel for municipal stadium.

CINCINNATI, 600 tons, bridge.

CINCINNATI, 5000 tons, Western Hills viaduct; general contract to McDougal Construction Co., Atlanta, Ga.

CHICAGO, 25,000 tons (preliminary estimate), Post Office.

CHICAGO, 3000 tons, Wendell Phillips High School.

CHICAGO, 1700 tons, theater at Sixty-third and Wallace streets.

MADISON, WIS., 175 tons, two steel truss spans in Sauk County; bids close Nov. 5.

ST. LOUIS, 125 tons, addition to foundry for Century Electric Co.

#### Western States

LOS ANGELES, 1750 tons, plates, 38 to 54-in. welded, steel pipe; bids Oct. 27.

SAN FRANCISCO, 5000 tons, plates, 36 and 44-in. welded, riveted or lock-bar pipe; bids Oct. 29.

HOWARD, WASH., 200 tons, bridge; bids opened.

#### Canada

SASKATOON, SASK., 2000 tons, Canadian National Railways Hotel.

FORT WILLIAM, ONT., 400 tons, technical school for Board of Education.

## Railroad Equipment

Great Lakes Steel Corpn., subsidiary of National Steel Corpn., is inquiring for 50 charging box cars.

Pacific Fruit Express is in the market for 600 steel underframes.

Inland Steel Co. is in the market for two six-wheel switching locomotives.

Virginian Railway will rebuild 500 to 600 coal cars. New bodies will be purchased, and some reclaimed material will be utilized for the remainder of the cars.

Chicago Great Western has ordered six heavy freight locomotives from Lima Locomotive Works.

## Less Coke Made in September

Output of by-product coke in September was 3,401,417 net tons, compared with 3,637,339 tons in August. Beehive production was 168,100 tons, against 169,500 tons, according to the Bureau of Mines. Of the September output of by-product coke, 2,455,000 tons, or 72.2 per cent, was made in ovens connected with blast furnaces.

During the month the Weirton Steel Co., Weirton, W. Va., fired a new battery of 25 Koppers-Becker ovens.



# Motor Car Production Unchanged, But Detroit Sentiment More Cheerful

DETROIT, Oct. 27.

**A**LTHOUGH it is difficult to put one's finger on facts looking toward an improvement in the industrial situation, sentiment here is the most cheerful in many weeks. There is little reason to believe that the automobile industry will show an upward trend in production until after the turn of the year, but in some cases releases of steel tonnages have brought encouragement. Business from other sources booked by sheet makers has helped somewhat to stop the gap created by curtailed purchases in the automotive field. Orders from stove manufacturers have been particularly good. This trend is further substantiated by pig iron houses, which recently have noticed a perceptible increase in shipments to general jobbing foundries.

Fisher Body plants operated in conjunction with Chevrolet assembly factories in various parts of the country have resumed work, giving employment to thousands of men. They have a good schedule for the immediate future, as Chevrolet is eager to stock its dealers with 1931 models as quickly as possible. Further reports about the new Chevrolet confirm earlier statements that it will have a more powerful engine and a larger, heavier body. Since the introduction of the model A Ford several years ago, Chevrolet has made a consistent effort to maintain a position in a higher bracket, graduating to the six-cylinder class and getting a price differential. The natural tendency at the moment would be for the company to strive to accentuate the difference between the Chevrolet and the Ford by putting the former on a still higher plane. Therefore, Detroit is assuming that the new Chevrolet will be a bigger and better car for the same money.

The Ford company's Rouge plant still is holding to the three-day-a-week program. Buick is said to be running on a like basis. Cadillac and Packard continue relatively busy, but the various Chrysler divisions and

Sentiment in Detroit steel trade most cheerful in many weeks.

\* \* \*

New Chevrolet reported to have more powerful engine and larger, heavier body.

\* \* \*

Welding making rapid strides in automobile manufacture.

\* \* \*

Detroit's automobile and steel plants to have natural gas for industrial purposes piped from Kentucky fields, according to project before City Council.

sumers amounted to 1,271,275 units and sales to dealers aggregated 1,351,066 units.

## Welding Is Gaining Favor

Welding is making rapid strides in the automobile industry. The Ford Motor Co. is using it extensively, while General Motors also is finding it advantageous. C. E. Wilson, vice-president of General Motors, emphasized this fact at the recent Society of Automotive Engineers production meeting. He prophesied that welding would come into constantly wider use, pointing out that General Motors is now getting lighter and stronger parts by welding together light stampings than by machining heavy castings. The Chrysler Corp. is building all-metal bodies by welding four sections into one piece; body companies likewise are pioneering in new methods of welding and have achieved notable results. Automotive engineers predict that many economies, improvements in design and safety features will be evolved in the next few years through the further development of the art of welding.

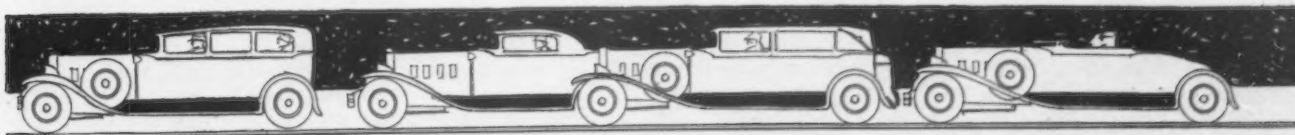
## Detroit Industries to Use Natural Gas

**D**ETROIT is to have natural gas for industrial purposes, according to the plans of the Northern Industrial Gas Co., a Delaware corporation organized by Texas interests to enter this city with a 390-mile pipe line originating in Kentucky. The company has applied for a day-to-day permit and City Council now is having a public utilities expert make a survey to report on its feasibility. If permission is granted, the company would construct some 40 miles of mains in the Detroit district. The 22-in. line would come into the city through Ecorse, at which point a branch would be built to the plant of the Great Lakes Steel Corp. The main line would lead north past the Rouge plant of the Ford Motor Co., then turn east to Hamtramck and

Hupp, Hudson-Essex, Oldsmobile, Lincoln and Oakland-Pontiac are doing little. Having just introduced new models, Nash and Reo have fairly good production schedules. It is understood that Studebaker's output has declined to about half of what it was when the new free-wheeling models came out. Detroit Hudson-Essex dealers are offering as high as \$500 allowances on 1930 Chevrolets in order to clean out stocks prior to Dec. 1. This leads to the belief that the new Hudson-Essex models will be out in December.

## General Motors' Output Less Than Sales

**A**UTOMOBILE companies have adhered closely this year to a policy of producing only enough cars to meet retail demands. An analysis of General Motors' sales shows that its various divisions have consistently carried out this policy during 1930. Up to Sept. 30 sales to consumers had totaled 900,252 units, whereas sales to dealers were 896,329 units. Thus, output actually has been less than purchases. This is in contrast with the figures for the corresponding period of last year, when sales to con-



thence south to East Jefferson Avenue, where plants of the Chrysler Corp., Hudson Motor Car Co. and Continental Motors Corp. are located. Lateral lines would serve a number of separated industrial areas within the city limits. M. J. Dewey, vice-president of the gas company, is quoted as saying that "natural gas will hasten the development of Detroit's new steel industry. We are now prepared to serve the Great Lakes Steel Corp., Michigan Steel Corp., the Newton Steel plant at Monroe, Mich., and other steel-mak-

ing plants of the area. Our line would run past the proposed plant of the American Rolling Mill Co." The rate proposed, averaging 39c. per 1000 ft., is said to be substantially lower than that for artificial gas used in commercial and industrial operations. It is understood that contracts already have been signed with 13 Detroit companies for delivery of approximately 13,200,000,000 cu. ft. of gas a year. The natural gas project, which probably will go through, will involve an expenditure of \$25,000,000 to \$30,000,000.

will perhaps be one-seventh greater than that of 1924, which is the year with which comparisons may better be made than with 1921. It will actually be a high year in tonnage.

The combined production of 1928 and 1929 exceeded current needs by about 12,000,000 to 13,000,000 tons. Current needs are determined, of course, by averaging the ups and downs of production over the years to get a measure of what is increasingly going into consumption. The current year's volume of steel will be fully 13,000,000 tons below indicated needs, thus balancing the excess of the preceding two years. All of this would suggest our entering 1931 with the slate more or less clean.

On the statistical basis, a continuation of the rate of consumption sufficient merely to meet needs, as it has been mounting in recent years, would require an engagement of the country's capacity to the extent of 75 per cent. The outlook is for a slow consummation of this rate of activity. There are no great deficiencies today such as existed in 1921 or even in 1924, as in building construction. There is at the moment no likelihood of a rapidly rising demand in any one quarter calculated to bring about a rapid expansion in the next several months.

It remains that chances of betterment are certainly positive rather than negative. The reassuring thing is that industry generally has come to appreciate the fact. It has been getting its house in order and the industrial machine has been overhauled and improved. It is ready to go into action as and when demand occurs. It will be run at a profit.

## Unjustified Pessimism

View Expressed at Atlantic City Meeting of Sheet Metal Distributors

**M**ILL relations and the business outlook were the topics of a meeting of the National Association of Sheet Metal Distributors held at Atlantic City, Oct. 21. Committee reports covered practices which are causing irritation and some remarks by W. W. Macon, editor of THE IRON AGE, touched on the steel situation.

### Mill Shipments of Sheets

The sheet steel committee is composed by F. J. McNeive, W. F. Potts Son & Co., Philadelphia, chairman; R. B. Shearer, C. S. Mersick & Co., New Haven; W. H. Bowe, Herrick Co., Boston; H. E. Usinger, Berger Bros. Co., Philadelphia, and Robert H. Lyon, Lyon, Conklin & Co., Baltimore.

In respect to quantity schedules, the committee holds that the quantity should only cover black and galvanized sheets for delivery at one time and that customers should not be allowed to include other items in making up quantities. Reports to it indicate the preference for a quantity schedule of 1 to 9 bundles, 10 to 49 bundles and 50 bundles and over. Every effort, it emphasized, should be made to discourage mill shipments in less than 25 bundles of standard sizes with a minimum of 5 bundles per item. The committee plans to arrange in the near future a conference with the committee representing the mills.

### Terne Plates

The committee on tin and terne plates is as follows: R. H. Lyon, Lyon, Conklin & Co., Inc., Baltimore, chairman; Everett Merrill, Merrill & Usher Co., Boston; H. E. Nickerson, Congdon & Carpenter Co., Providence; F. M. Fuller, American Sheet & Tin Plate Co., Pittsburgh, and T. E. Millson, Weirton Steel Co., Weirton, W. Va.

A questionnaire to members indicates that 8-lb. terne plates are the best seller, followed closely by the 20-lb. for second place and 40-lb. the next most popular weight. The survey indicates

it might be possible to simplify further the terne plate schedule. The investigation also brought out that 75 per cent of the members find demand is toward heavier coatings.

### Brass and Copper Sheets

The committee on brass and copper is composed as follows: A. H. Howe, J. M. & L. A. Osborn Co., Cleveland, chairman; George O. M. Johnston, McClure-Johnston Co., Pittsburgh; R. J. Smith, Eastern Metals Corp., Philadelphia; F. A. Wilkening, Standard Metal Co., Indianapolis, and W. E. Waters, Merchant & Evans Co., Philadelphia.

Discontinuance of direct mill competition was characterized not only essential but imperative. Resale price schedules, in the opinion of some, should cover not only larger quantities, but also case and less than case lots from distributors' stocks. It was also suggested that discontinuance by mills of the practice of consigning stocks would prove helpful.

### Steel Outlook

Mr. Macon emphasized particularly that there is altogether too much pessimism. It appears, certainly in respect to the basic steel industry, that the current depression is the least severe of the seven which have occurred in the last 40 years. One needs only to discover that in nine months in the 1921 collapse steel production showed a reduction of 73 per cent, whereas in 13 months this year the recession was 43 per cent. The five other depressions lay in between these figures. Similarly, the fall in prices nine years ago was 50 per cent from high to low in steel and 62 per cent in pig iron, while this year it was 11 per cent in steel and 10 per cent in pig iron, as represented by THE IRON AGE composite prices.

More than that, steel output this year, although it may represent a 25 per cent falling off from that of last year—a record by a large margin—

### Prof. Moore to Speak on the Radio Nov. 1

H. F. Moore, professor of engineering materials, University of Illinois, Urbana, Ill., will deliver a radio address, Saturday, Nov. 1, at 7.15 to 7.30 p. m., Eastern standard time, on the "Romance of Engineering Materials." This has been arranged by the American Society for Testing Materials, 1315 Spruce Street, Philadelphia. It will be heard over 32 stations from New York to North Dakota. At New York, WABC will do the broadcasting.

### Two Steel Fabricating Companies Merge

The Fort Pitt Bridge Co., Pittsburgh, and the Massillon Bridge & Structural Co., Massillon, Ohio, have been consolidated as the Fort Pitt Bridge Works Co., with assets of approximately \$4,000,000. The combined companies will have an annual capacity of 125,000 tons of fabricated structural steel. Theodore A. Straub is president of the new company; H. R. Bickle, vice-president, and P. B. Straub, secretary-treasurer. All were formerly identified with the Fort Pitt company.



# Selling Is Today's Problem

Attention to It Urged at Steel Fabricators' Meeting at Pinehurst

PINEHURST, N. C., Oct. 28.—Production is less than half of today's problem, said Charles F. Abbott, executive director of the American Institute of Steel Construction, in his annual report to the institute, opening here today for a four-day meeting. "The big job," he asserted, "is to sell. And selling has its technique quite as much as engineering or manufacturing."

"There should be no complaint of overproduction until as much time and money has been expended on trying to sell and develop the market as is spent on trying to increase output and lower costs." He emphasized that it has been the plan of the institute to increase consumption beyond the capacity output of the industry.

The important immediate requirements of the association he listed as follows: More field engineers, a larger appropriation for technical research and an advertising campaign large enough to win public support and promote the battledeck steel plate floor. "The rolling mills and plate mills should attach a value to this new tonnage and provide larger contributions in order that their responsibility as producers may be fairly reflected in promoting new markets."

The structural fabricating plants of the country, with a capacity of 400,000 tons of steel construction a month, against 180,000 tons in 1909, have been running up to nearly 75 per cent of capacity. "It is encouraging to find," said Mr. Abbott, "that the distribution of fabricated structural steel has been able to hold its own and has not dropped off in proportion to the declines in other industries, in spite of the decreased rate of building construction."

"New York is about to build a 100-story structure. Chicago will erect an all-steel apartment house. The Hudson River Bridge, two-thirds of a mile long, will shortly be exceeded by the proposed Golden Gate Bridge. Steel-plate floors, alloy-steel walls and other technical improvements are developing new markets."

"Closer bonds with the steel construction industries of Canada, Germany, England, France and other countries have been effected the past year. A new working arrangement between the American Institute of Steel Construction and the Canadian Institute of Steel Construction was recently perfected."

President Charles N. Fitts, New England Structural Co., Boston, and Lee H. Miller, chief engineer of the institute, also detailed the organization's activities, which prove to be unusually numerous and diversified.

Mr. Fitts argued that the appropriation for advertising steel construction should be at least \$200,000 per annum and programs of its use should be drafted on a three-year basis.

He pointed out that, with the single exception of Chicago, the institute's standard specification is now practically universal throughout the country.

The industry is today selling three and one-half times as much steel work as it did prior to the war.

The battledeck steel plate floor will at least double the present tonnage of business within the very near future.

Following the use of alloy steels as part of the exterior walls of two New York buildings, the next step will be all metal walls that will make the structure cheaper, more lasting, and more efficient than a similar building with masonry walls and floors.

The steel house, once the public becomes convinced of its economy and distinctive quality, will be a valuable advertising medium for the industry as a whole and the parts of the industry not now concerned should be ready to lend assistance to those who are endeavoring to make a steel house a reality.

## Gray Iron Castings Make First Gain in Six Months

Production of gray iron castings gained in September for the first time in six months, as is shown by the monthly report of the Gray Iron Institute, Cleveland. Production during the month, 169 foundries reporting, was 65.7 per cent of normal, compared with 62.8 per cent in August. However, new business and unfilled orders declined. New business in September, 86 foundries reporting, was 49 per cent of normal, compared with 56.3 per cent in August and unfilled orders, 74 foundries reporting, were 37.03 per cent of normal, compared with 48.4 per cent in August.

Foundries in the district including Wisconsin, Illinois and the territory west of the Mississippi River reported the greatest activity. These operated last month as shown by reports from 59 foundries at 69.6 per cent of normal, compared with 65.3 per cent in August. Twenty-four foundries in the Chicago district increased operations to 68.2 per cent from 61.1 per cent in August. Foundries in Pennsylvania, Ohio and Michigan and the South, east of the Mississippi River, 59 reporting, showed 65.3 per cent of normal operations last month as compared with 65.4 per cent in August. Foundries in

New England, New York, New Jersey and Canada, 51 reporting, operated at 61.4 per cent of normal, against 55.8 per cent during the previous month.

Small foundries with a monthly capacity of 100 tons and under made the best showing, 62 reporting operations at 76.6 per cent of normal in September, against 72.5 per cent during the previous month. Those with a capacity of from 100 to 250 tons a month operated 61.5 per cent, those with a capacity of 250 to 400 operated at 66.1 per cent, and those having a capacity of over 400 tons a month operated at 65.6 per cent of normal.

## Federal Shipbuilding Low on Four Ocean Ships

WASHINGTON, Oct. 28.—The Federal Shipbuilding & Dry Dock Co., Kearny, N. J., has submitted the lowest bids for construction of four vessels for the Panama Steamship Co. and the Grace Steamship Co. For building four turbo-electric driven ships with electric winches, the Federal bid was \$15,920,000 and with steam winches the bid was \$15,830,000. The bids of this company for building double reduction gear-driven ships were \$15,692,000, with electric winches, and \$15,602,000, with steam winches.

## Steel Furniture Orders Gain In September

WASHINGTON, Oct. 28.—Orders for steel furniture in the "business group" were valued at \$1,794,751 in September, against \$1,787,781 in August, according to reports received by the Department of Commerce from 34 producers. Shipments in September were valued at \$1,879,151, against \$1,985,473 in August, and unfilled orders at the end of September were valued at \$1,248,460, compared with \$1,330,678 at the end of August.

Orders for shelving furniture in September were valued at \$508,973, against \$524,270 in August. September shipments were valued at \$496,253, against \$554,041 in August, and unfilled orders at the end of September were valued at \$716,581, against \$703,537 at the end of August.

## Large Beryllium Deposits Reported in California

What are reported to be large deposits of a beryllium ore are located near South Gate, Cal. The ore is said to run from 100 to 800 ft. deep and as much in breadth and length. Samples analyzed in New York, Ohio and California indicate that the ore runs better than the average and that the tonnage seems unlimited. Also, it is stated to compare favorably with sample deposits from China and Germany. This information is furnished by Meigs J. Campbell, 10,231 Capistrano Avenue, South Gate, Cal.

# PERSONALS



Isaac M. Scott



H. Holiday



A. K. Lewis

ISAAC M. SCOTT, president of the Wheeling Steel Corp., Wheeling, W. Va., since its inception in 1920, has resigned, effective immediately, and has announced no new connection. Mr. Scott was born in Tuscarawas County, Ohio, in 1866 and began his career in the steel industry in 1883 with the old Aetna Iron & Nail Co., Bridgeport, Conn. He continued with this concern and its successor, Aetna-Standard Iron & Steel Co., until 1893, serving successively as paymaster, invoice clerk, bookkeeper and assistant secretary. He then went with the Beaver Tin Plate Co., Lisbon, Ohio, as secretary-treasurer, but returned to the Aetna-Standard company in 1898 as secretary. When that organization was acquired by the American Sheet Steel Co. in 1889, he became auditor of the latter company, serving in that capacity until 1903. At that time he became treasurer of the La Belle Iron Works, Steubenville, Ohio, and was elected president in the following year. He left this company to organize the Yorkville Tin Plate Co., which built tin mills at Yorkville, Ohio. When the Yorkville company was taken over by the Wheeling Steel & Iron Co., he became president and served in that capacity until the organization of the Wheeling Steel Corpn.

A. K. LEWIS, heretofore works manager of the Butler, Pa., plant of the American Rolling Mill Co., has been made assistant vice-president, succeeding the late M. E. Danford. Mr. Lewis will be located at the company's general offices in Middletown, Ohio. He joined the Armco organization as chief draftsman in 1910. In 1923 he became director of personnel and served in that capacity until September, 1927, when he be-

came works manager at Butler. HARRY HOLIDAY, who has been general superintendent at Butler, has been appointed works manager. He is a graduate of Carnegie Institute of Technology and was in charge of the wheel works of the Columbia Steel Co. at Butler when that plant was merged with Armco in 1927.

GEOFFREY SUMMERS and SPENCER SUMMERS, directors of John Summers & Sons Co., Ltd., Shotton, England, are on a business visit to the United States. They are conferring with officials of the American Rolling Mill Co., Middletown, Ohio, relative to the expansion program being carried on for the manufacture of high finish sheets in Great Britain, in which the two firms are jointly interested. John Summers & Sons Co., Ltd., is the largest manufacturer of sheet steel in

Europe. The company operates 86 sheet mills, with a monthly capacity of 86,000 tons of steel.

REAR - ADMIRAL DAVID WATSON TAYLOR, retired, has been awarded the John Fritz gold medal for 1931 "for outstanding achievement in marine architecture, for revolutionary results of persistent research in hull design, for improvement in many types of warships and for distinguished service as chief constructor of the United States Navy during the World War."

CHARLES HART, president, Wrought Iron Co. of America, Lebanon, Pa., has resigned effective Nov. 1, but will retain his place on the board of directors.

W. E. SMITH, formerly chief engineer and service manager of the Carboloy Co., has become manager of the Widia department of the Wesson Sales Co., Detroit.

FRANK GOULD, for many years vice-president and during the last two years president of the *Manufacturers Record*, has become its editor, succeeding the late Richard H. Edmonds.

VLADIMIR V. DE SVESHNIKOFF, consulting chemical and metallurgical engineer, has been appointed by the aluminum oxide abrasive industry as research associate to the Bureau of Standards, Washington. During a period of five years in the United States, beginning in 1919, Mr. de Sveshnikoff served as assistant physicist in metallurgical research at the bureau on problems of the Ordnance Department, United States Army, and of the fixed nitrogen re-



Spencer Summers

Geoffrey Summers



search laboratory. Since 1924 he has acted in a private capacity as consulting engineer in the fields of chemistry and metallurgy.

OREN H. PERSONS, formerly assistant manager of sales, American Steel & Wire Co., Philadelphia, has resigned, and will be identified with the Edgcomb Steel Co., Philadelphia, steel distributor, as general manager of sales.

THEODORE C. WILSON, for some time associated with the New England pig iron division of the Republic Steel Corp., and formerly with the Donner Steel Co., has severed his connections with the company.

H. E. YOUNGGREN has been appointed traffic manager of the Kewanee Boiler Corp., Kewanee, Ill. This is one of the positions formerly held by H. D. CHERRY, secretary of this company, who recently retired.

E. L. ESSLEY, president, E. L. Essley Machinery Co., Chicago, has returned this week from a 10 weeks' sojourn in Europe.

L. D. MERCER and F. L. ROWND have been appointed assistant managers of sales of the sheet and tin plate division of the Republic Steel Corp., with headquarters at Youngstown.

H. A. BRASSETT, president, H. A. Brassett & Co., Chicago, consulting engineer, has returned from London after a week of conferences on the reconstruction of the British iron and steel industry.

DR. OSCAR SEMPLE, a member of the executive committee of the United Steel Works of Germany, is in the United States on business. He attended the meeting and banquet of the American Iron and Steel Institute in New York last Friday as the guest of GEORGE E. DIX, the company's American representative.

A. A. WILMOT has been appointed assistant sales manager in charge of structural products at the Chicago office of the Wickwire Spencer Steel Co., 208 South LaSalle Street, that city. Mr. Wilmot has been a member of the New York sales department of the company for the past five years. G. L. CRAWFORD, who has been a member of the Chicago sales staff for the past four years, has been appointed assistant sales manager in charge of structural products at the company's office in Tulsa, Okla.

FRANK H. COLLADAY has severed his connection in the airplane manufacturing business and returned to the tin plate industry, with which he has been identified for a large part of his career, and he is now general manager of sales of the Washington Tin Plate Co., with headquarters at Washington, Pa.

## ▲ ▲ ▲ OBITUARY ▲ ▲ ▲

EBENEZER A. W. JEFFERIES, manager of the gas producer department of the Morgan Construction Co., Worcester, Mass., died in that city Oct. 20, after an illness of several years. He was 68 years old. He had been connected with the company for



E. A. W. Jefferies



E. J. Campion

20 years, and played an important part in the development of its gas-producing equipment, particularly in the earlier stages. Mr. Jefferies was born in England and came to America when he was 20 years old. He entered the employ of the R. D. Wood & Co. Later he went with the Morgan Engineering Co. and from there to the Morgan Construction Co.

E. J. CAMPION, superintendent of Canadian Steel Foundries, Ltd., Montreal, died suddenly in Cleveland on Oct. 15, aged 52 years. He was born in Lowell, Mass., and started in the steel business when he was 16 years old with the Nashua Iron & Steel Co.,

Nashua, N. H. In 1897 he became identified as open-hearth melter with the Benjamin Atha Steel Co., Newark, N. J. Nine years later he was made open-hearth superintendent of the American Steel Foundries at Franklin, Pa. He then went with the Ontario Iron & Steel Co., and several months later returned to the American Steel Foundries. He became identified with Canadian Steel Foundries, Ltd., as assistant superintendent in 1917.

ALBERT GRAHAM, one of the oldest bolt and nut manufacturers in the United States, died at his home in Pittsburgh on Oct. 28. He was born in Allegheny County, Pa., on March 17, 1848, and began his business career with the old Eagle Rolling Mill, West End, Pittsburgh. He became associated with the bolt and nut industry in 1881 in the firm of Williams, Charles & Co., and at the death of Mr. Charles 12 years later secured an interest in that organization. The firm was then operated under the name of John Charles Co. Mr. Graham succeeded the Charles interests in 1895, continuing the company under the old name until 1902, when it was incorporated as the Graham Nut Co. This company continued to operate under that name during Mr. Graham's period of activity in business. He had retired from active participation in 1922. A son, Charles J. Graham, is at present head of the Bolt, Nut and Rivet Association, with headquarters in Pittsburgh.

JOSEPH BOYER, chairman of the board, Burroughs Adding Machine Co., Detroit, died Oct. 24 following 10 days' illness of pneumonia. Born on a farm near Pickering, Ont., in 1866, he began an apprenticeship in the machinists' trade and after three years opened a small machine shop in St. Louis. It was there that he first became associated with William Seward Burroughs, who made the first Burroughs adding machine in 1884. Mr. Boyer invented a pneumatic hammer, air drill and railway speed recorder during the several years in which he operated his shop. In 1888 he organized the Boyer Machine Co. to manufacture these devices. This company was merged with the Chicago Pneumatic Tool Co. in 1901. Four years later Mr. Boyer became president of the Burroughs Adding Machine Co., which supplanted the American Arithmometer Co., of which he was the head. In 1920 he was elected chairman of the board.

A. H. BEALE, for the past six years president of A. M. Byers Co., Pittsburgh, died suddenly in Chicago on Oct. 28. He had left Pittsburgh the night before apparently in good health.

## October Machine Tool Business Made No Advance

Prospective Buyers  
Now Postponing  
Action to New Year

**M**ACHINE tool business this month probably has shown no advance over that of September. Although the official figures of the National Machine Tool Builders' Association for October will not be available for a few weeks, it seems likely that the gain of September over August has not been duplicated. A slight decline from the September sales total is indicated by trade reports.

As hopes for a general business revival during the remainder of this year are dwindling, it is not surprising that there should be a tendency among prospective buyers to postpone contemplated purchases until next year. Inventory considerations will be especially to the fore in a period when most companies will be desirous of making the best possible financial report to their stockholders.

Many machine tool companies are concentrating on missionary work that may prove fruitful when manufacturers are in a buying mood. The machine tool trade does not lack for prospects, as many manufacturers have inquired for tools in the past few months that have not yet been bought, and orders may be forthcoming when there is ample evidence that business is definitely on the mend.

### New York

Machine tool buying during October has shown no gains over the September volume, and it is quite likely, when totals are figured up this week, that the sales for many local offices will be less than those of last month. At the end of September the outlook for October seemed to be fairly promising, but business has not come up to expectations, even though they were moderate. During the past week there has been lack of new inquiries, and there is in evidence a disposition on the part of those who have recently sent out inquiries to postpone buying, possibly until after the first of the year, as hopes are dwindling that there will be any important improvement in general business until 1931.

### Cleveland

While business picked up a little with one or two dealers the past week, orders were not in sufficient volume to indicate any general upward trend. Inquiry continues light. A northern Ohio public utilities company purchased a 24-in. lathe and an 8-in. pipe machine, and a Toledo company three large wood-working machines. October business will show little change as compared with September. Not much activity is looked for during the remainder of the year. Operations of metal-working plants in this territory show no gain. Few are running at over 50 per cent of capacity.

### New England

Machine tool dealers report more inquiries the past week than in the past two months combined. Current sales, however, are negligible. Industrial New England, so far as metal-working plants are concerned, has not

gained much this month. Virtually all metal-working plants are on part time and operating with reduced forces.

One local used tool dealer sold two shapers the past week to a Massachusetts shop.

### Chicago

Improvement in business, reported for the country as a whole by the machine tool builders' group, does not hold true with Chicago dealers. New purchases are few in number and fresh inquiries are not in sufficient volume to forecast betterment in the near future. There are a few instances where October business is reported as running ahead of September, but this is not the case with the market as a whole.

An encouraging sign comes from railroad shops where men are being added to payrolls. This means little in the way of immediate business from this source, but it strengthens the hope of sellers that 1931 budgets will include machine tools to be bought early next year. The Milwaukee Road which ordered and then suspended many items on a car shop list has now canceled the orders and will include the equipment in next year's budget. Prices on used machine tools are lower.

### Milwaukee

While machine tool trade keeps moving in a somewhat hesitant way, encouraging signs of a revival in demand are appearing with more frequency. These have reached the point in one or two plants where rehiring of shop men has become necessary. Inquiry is steadily growing, but prospective buyers are still slow in acting. Otherwise, buying is limited mainly to urgent replacement needs, and the

general run of orders calls for single tools. Tool rooms are fairly busy on orders for special equipment and devices, both for replacement and to broaden scope of existing equipment.

### Cincinnati

Fresh bookings of machine tool manufacturers in this district increased slightly the past week, but not in sufficient volume to warrant any change in present schedules of operation. Improvement was particularly noticeable among lathe manufacturers, but it was not sufficient to offset the slackness of demand earlier this month. Production continues at a low rate.

A manufacturer of automobiles has placed an order with a local maker for five engine lathes, and the Amtorg Trading Corp. has purchased two lathes.

### Pittsburgh

October business is disappointing to local machinery dealers. The tendency to concentrate activity on next year's prospects is more pronounced. Orders during the remainder of this quarter are not expected to bulk large. No extensive industrial or railroad lists are before the trade and awards have been completed on several projects which occupied attention during the summer.

The American Steel Foundries, Chicago, has a considerable improvement program in progress at its Pittsburgh plant. Other plants catering to the railroads are hardly so optimistic and, with low operations, are buying few tools. The Baltimore & Ohio, which plans to build 2000 freight cars in its own shops, is not expected to make significant tool purchases prior to the operation.



## New York

**P**LANS have been filed by Frank S. Parker, 119 West Fifty-seventh Street, New York, architect and engineer, for a six-story automobile service, repair and garage building at 629-35 West Fifty-fourth Street, to cost about \$400,000 with equipment.

American Cyanamid Co., 535 Fifth Avenue, New York, and Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, have arranged joint plan for development of products used by both organizations, and plan early construction of plant in South, with tidewater facilities, for production of caustic soda, soda ash and kindred products. Initial works will cost over \$500,000. It is understood that plans will be drawn and erection supervised by Chemical Construction Co., Charlotte, N. C., an interest of first-noted company. Pending construction, production will be concentrated at works of Columbia Chemical Division of Pittsburgh company at Barberton, Ohio.

Donigan & Nielson, 745 Third Avenue, Brooklyn, manufacturers of commercial automobile bodies, have plans for a one-story plant unit, to cost over \$30,000 with equipment. Samuel L. Malkind, 93 Court Street, Brooklyn, is architect.

American Brake Shoe & Foundry Co., 230 Park Avenue, New York, is contemplating a new foundry at Quebec, to cost over \$50,000 including equipment.

Patrick J. Murray, 14 West Forty-fifth Street, New York, architect, has plans for a two-story automobile service, repair and garage building, 90 x 250 ft., to cost about \$125,000 with equipment.

Enmore Iron Works, Inc., Brooklyn, has been organized with capital of \$20,000 to take over and expand company of same name at 301 Third Avenue. Fred

Hallpurn and M. D. Levine are principal incorporators of new company.

Gillette Safety Razor Co., West First Street, South Boston, has purchased plants and business of Auto Strop Safety Razor Co., Inc., 656 First Avenue, New York, and will operate as a subsidiary. Plants of acquired company at Toronto, Ont., and London, England, will be continued in operation. Purchasing company is disposing of a bond issue of \$20,000,000, part of fund to be used for acquisition of property and expansion in output.

National Biscuit Co., 447 West Fourteenth Street, New York, has awarded general contract to V. L. Nicholson Co., 102 West Clinch Avenue, Knoxville, Tenn., for one-story storage and distributing plant, 55 x 125 ft., at Knoxville, to include conveying, loading and other handling equipment, to cost about \$50,000.

Paramount Ice Co., 241 Ellery Street, Brooklyn, has awarded general contract to William Werner & Son, Brooklyn, for one-story ice-manufacturing plant, 100 x 150 ft., to cost about \$75,000 with machinery. George J. Lobenstein, 885 Flatbush Avenue, is architect.

Bergen Square Garage, Jersey City, N. J., care of Charles Shilowitz, 26 Journal Square, Jersey City, architect, has revised plans for a five-story service, repair and garage building, to cost about \$350,000 with equipment.

Eastern Airport Transport, Inc., Newark Airport, Newark, has leased more than eight acres at local airport and plans construction of hangars, repair shop and other field units, to cost over \$75,000 with equipment.

M. & H. Machinery & Engineering Co., Newark, recently organized, care of Albert W. Neuscheler, 40 Clinton Street, real estate, has purchased property at Lockwood and Esther Streets, and plans

early erection of new plant, to cost over \$40,000 with equipment.

Arcoill Mfg. Co., 81-3 Pennington Street, Newark, manufacturer of oil burners and oil-burning equipment, has leased floor in factory at Hecker and Duryee Streets, and will remove to that location, increasing present capacity.

R. C. Jenkinson & Co., Inc., Newark, has been organized with capital of \$125,000 to take over and expand company of same name, manufacturer of sheet metal and wire goods, with plant at 293 Washington Street. Anthony D. and Ernest Mazzel are principal incorporators.

Lakewood Studio Co., Lakewood, N. J., care of Daniel J. Scrocco, 60 Park Place, Newark, architect, has plans for a motion picture studio and radio broadcasting station on 4000-acre tract at Pine Forest Manor, near Lakewood, consisting of main unit, 200 x 800 ft., and 50 ft. high, and ten-story broadcasting tower, to cost over \$750,000 with equipment, power station and other mechanical units. George H. Glass is president.

Campbell Industrial Window Co., Inc., 1607 Pershing Square Building, New York, has engaged in manufacture of all types of industrial windows and doors. Its line includes casement windows, horizontally pivoted industrial windows and projected windows of commercial, architectural and office types, utility windows and continuous windows and doors. Milton T. Clark, formerly vice-president of the Truscon Steel Co., Youngstown, and manager of its Steel Window Division, is president of the new company, which is owned by Campbell Metal Window Corp., manufacturer of solid-section, double-hung windows, and a subsidiary of American Radiator & Standard Sanitary Corp.

Viking Tool & Machine Co., Inc., has moved its office and factory from 745

## INDUSTRIAL ACTIVITY

### Prospects Revealed by a Survey of Construction Projects

**N**EW construction of the past week requiring machinery and other equipment totals more than \$32,000,000, exclusive of \$180,000,000 in bond issues. This compares with about \$53,000,000 a week ago and only \$22,000,000 two weeks ago. Of the week's total, close to \$1,000,000 is in metal-working plants, \$5,500,000 in electric power stations and transmission lines, \$4,000,000 in artificial gas plants and natural gas lines, \$5,500,000 in railroad terminal and other construction, \$1,000,000 in large garages and service stations and \$150,000 for airports at Newark, N. J., Miami, Fla., and Fayetteville, Ark. Not included in the airport improvement total is \$10,000,000 to be spent by Boston at Governor's Island in Boston Harbor, when the site is released by the Federal Government.

The larger industrial projects include pulp mills at St. Helens, Ore., and Richvale, Cal., costing \$200,000 each, a \$750,000 motion picture studio and broadcasting station at Lakehurst, N. J., and improvements in the water supply system at Charleston, W. Va., to cost \$300,000.

Among the important expenditures in the electric power field is a \$20,000,000 electric generating

station at Herndon, Pa., for the Pennsylvania Power & Light Co., a 70-mile transmission line from Calipatria to Blythe, Cal., to cost \$325,000, and a hydroelectric plant at Seattle, Wash., \$2,000,000.

Oil company construction of close to \$1,000,000 includes a \$350,000 storage and distribution plant for the Sinclair Oil & Gas Co. in Oklahoma City, Okla., and a \$100,000 refinery at Luling, Tex., for the Magnolia Oil Co. A natural gas line costing \$3,500,000 is to be constructed from the Texas Panhandle to Omaha, Neb.

The railroads have moved into an important place this week, the Pennsylvania planning a coal-  
ing station at Erie, Pa., to cost \$800,000, while the Reading will spend \$1,500,000 on further electrification, and the Louisiana & Arkansas is planning a \$3,000,000 warehouse and freight terminal in New Orleans.

Vocation school construction totals close to \$2,000,000 for school buildings and equipment in Milwaukee, San Benito, Tex., Yankton, S. D., New Canaan, Conn., and Cookeville, Tenn.

Sixty-fifth Street, Brooklyn, to a new plant at Mill and Main streets, Belleville, N. J.

H. Weiner & Co., Pottsville, Pa., have opened a branch office and yard at 1955 Park Avenue, Weehawken, N. J., for purchase and sale of new and second-hand steel beams, channels, angles, flats, rounds, squares, plate, concrete bars, pipe, etc., in mill lengths and cut to size. Company is also agent for Superior Oxy-Acetylene Machine Co., maker of welding and cutting outfits. Benjamin Alpern is manager of new branch office and yard.

Utility Blower Co., Inc., recently organized, has leased part of plant at 42 Spring Street, Newark, for manufacture of blowers and blower systems.

Manhattan Foundry & Model Co., Inc., has started operations in a two-story factory at 560 West Twenty-sixth Street, New York, for manufacture of brass, bronze and aluminum castings, also wood and metal patterns. P. A. Fortomaro, president, and G. Sprogis, secretary, were formerly with Walker M. Leavitt Co.

Hartig Engine & Machine Co., formerly Hartig Gas Engine Co., Newark, has moved to new plant at 536 Hillside Avenue, Hillside, N. J. Company manufactures phonograph record machinery and does general machine work. W. M. Korn is president, and E. Switzer, secretary-treasurer.

## New England

**C**ONTRACT has been let by Blake & Johnson Co., Waterville, Conn., manufacturer of screw machine products, to Thomas Moran & Sons, Waterbury, Conn., for an addition, 41 x 50 ft., to cost about \$20,000 with equipment.

Illinois Wire & Mfg. Co., Joliet, Ill., is erecting two one-story units, 28 x 32 ft., and 28 x 36 ft., at Waltham, Mass., for factory branch and distributing plant for New England district.

Steel Roll Repairing Co., Fall River, Mass., recently organized by John C. Gardner, South Swansea, Mass., and associates, plans operation of general mechanical and machine works, including foundry unit, etc., at Fall River. Mr. Gardner is president and treasurer.

Merrimac Chemical Co., Chemical Lane, Everett, Mass., manufacturer of industrial chemicals, has awarded general contract to J. F. Griffin Co., 250 Stuart Street, Boston, for a one-story addition, to cost close to \$60,000 with equipment. Company also has plans for a three-story unit, 75 x 125 ft., for alum works, to cost over \$85,000.

Department of Parks, Boston, William P. Long, commissioner, is closing arrangement with Government for transfer of Governor's Island to city for a municipal airport in Boston Harbor. A fund of over \$10,000,000 will be used to develop property, including hangars, repair shops and other field units. Project will require about 24 months for completion.

Park City Ice Co., 558 Howard Avenue, Bridgeport, Conn., has plans for a two-story addition, 44 x 56 ft., primarily as a tank department, to cost over \$40,000. Harry Koerner, Bridgeport, is architect.

Segal Lock & Hardware Co., South Norwalk, Conn., is planning to double capacity of plant of subsidiary, Universal Safety Razor Co., for production of a new single unit safety razor. Main offices are at 12-14 Warren Street, New York.

Board of Education, New Canaan, Conn., is considering installation of man-

ual training equipment in new junior high school, to cost about \$275,000, in which amount a bond issue has been authorized. John N. Pierson & Son, 198 Jefferson Street, Perth Amboy, N. J., are architects.

## Milwaukee

**I**NTERESTS identified with Waukesha Motor Co., Waukesha, Wis., have incorporated Fawick Mfg. Co., capital stock \$300,000, to manufacture a newly designed industrial clutch. Production for present will be carried on in plant of Hein-Werner Motor Parts Co., Waukesha, which also is identified with principals in Waukesha Motor Co. Thomas F. Fawick, Akron, Ohio, inventor of new clutch, is president and chief engineer of new corporation. S. A. Perkins, secretary-treasurer, Waukesha Motor Co., is vice-president, and C. L. Eason, Detroit, secretary-treasurer.

Spring City Foundry Co., Waukesha, Wis., specializing in automotive gray iron castings, has placed general contract with William F. Tubising Co., 708 Oakland Avenue, Milwaukee, for new cupola building, 30 x 80 ft., three stories, and 40 x 70 ft., one story, costing about \$65,000 with equipment. Frank D. Chase, Inc., 720 North Michigan Avenue, Chicago, is consulting engineer. W. J. Grede is president and general manager.

Milwaukee Parts Corp., 607 South Sixth Street, Milwaukee, has increased capitalization from \$53,000 to \$150,000 to finance production of new airplane engine. Plans are being made for extending floor space and equipment, but details are not yet available. Liberal volume of orders is on books. A. J. Tank is president.

E. G. Doudna, secretary, State Board of Normal Regents, State Capitol, Madison, Wis., is taking bids until Oct. 31 for construction and equipment of \$250,000 power plant, 64 x 71 ft., with ramp, 14 x 105 ft., at Milwaukee State Teachers' College, Milwaukee. Plans are by Arthur Peabody, State architect, Madison.

Bids are being taken by George H. Sage, city clerk, Spooner, Wis., for new \$50,000 municipal power plant. Equipment specifications include one 160 to 200-hp. Diesel engine, one 240 to 250-hp. Diesel engine and auxiliary equipment, one 108 to 136-kw. engine-type alternator and exciter, one 160 to 168-kw. engine-type alternator and exciter, switchboard, etc.

Chain Belt Co., Milwaukee, has moved to 1600 West Bruce Street.

## Philadelphia

**P**LANS have been approved by Reading Co., Philadelphia, for electrification of another section of Philadelphia & Reading lines from Langhorne, Pa., to West Trenton, N. J., to cost \$1,500,000 with equipment. Work will be carried out in connection with general electrification program under way in Philadelphia district. Company engineering department is in charge.

Abrasive Products Co., Philadelphia, recently organized by William B. Byers, 465 State Road, Bala-Cynwyd, Pa., and associates with capital of \$50,000, plans operation of works at Lansdowne, Pa., for production of grinding wheels and other abrasive products. Mr. Byers will be treasurer of company.

Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has plans

for new artificial gas storage and distributing plant at West Conshohocken, Pa., to cost about \$800,000 with equipment.

Philadelphia & Reading Coal & Iron Co., Reading Terminal, Philadelphia, has arranged for discontinuance of power plants and in future will secure all power from Pennsylvania Power & Light Co., Allentown, Pa., which will take over generating stations of Philadelphia & Reading company at Locust Gap and Good Springs, Pa., with transmission lines and power substations in Northumberland, Columbia and Schuylkill Counties, as well as power site at Herndon, Pa. At latter place Pennsylvania company plans erection of new steam-operated electric generating station to cost over \$20,000,000 with transmission system. Last-noted company will secure all fuel requirements in future from Philadelphia & Reading company. Pennsylvania Power company is considering new bond issue to total close to \$100,000,000, part of fund to be used for proposed generating station and acquisition of present plants of Philadelphia & Reading company.

American Paper Products, Inc., 2113-17 Rush Street, Philadelphia, manufacturer of paper and cardboard tubing and kindred products, is planning expansion and will remove to new location where additional equipment will be provided. Charles Halbert is secretary and treasurer.

Merchants & Miners Transportation Co., Pier 18, South Wharves, Philadelphia, is planning to rebuild machine shop, wood-working shop and other buildings damaged by fire Oct. 23, including pier structures 18 and 20, with loss of more than \$150,000 including equipment.

C. E. McEwen, Jr., York, Pa., and associates have organized Automatic Refrigeration Co., with capital of \$25,000, to operate a local plant for manufacture of refrigerating machinery and parts. Mr. McEwen will be treasurer.

## Buffalo

**P**LANS have been filed by Felton Construction Corp., 1450 Michigan Avenue, Buffalo, general contractor, for a one-story addition to structural works for assembling, to cost about \$25,000.

Pfauder Co., Gas & Electric Building, Rochester, N. Y., manufacturer of glass-lined and enameled steel tanks and kindred equipment, and General American Tank Car Corp., Illinois Merchants Bank Building, Chicago, have organized General American-Pfauder Corp., to develop and operate a railroad refrigerator tank car business. General American company will build new car bodies at shops at East Chicago, Ind., while Pfauder company will concentrate on production of glass-lined tanks and other equipment for new car units.

Herbert Henry, West River Street, Grand Island, N. Y., and associates have organized Federal Anti-Capacity Switch Corp., with headquarters at Buffalo, and will operate plant at latter place for manufacture of electric switches, marine equipment, etc. Frank B. Henry, 56 North Forest Road, Williamsville, N. Y., is interested in new company.

Industrial Furnace Corp., M. & T. Building, Buffalo, manufacturer of electric furnaces, parts, etc., has arranged for purchase of Hays Process Co., Chicago, producer of similar equipment and controlling patents used by first noted company in its furnace units, and will consolidate. A subsidiary company has also



been formed under name of Industrial Furnace Engineering Corp., to handle construction and erection of furnaces produced by parent organization. Harry O. Breaker is president of both companies, and D'Arcy W. Roper, secretary and treasurer.

Niagara Falls Smelting & Refining Corp., 2204 Elmwood Avenue, Buffalo, has laid cornerstone of first unit of a new plant to take care of increased business of company and its subsidiary, Eureka Metal Products Corp. E. G. Jarvis is president.

## South Atlantic

**C**ONTRACT has been let by Chesapeake & Ohio Railroad Co., Richmond, Va., to J. A. Fix & Sons, Lynchburg, Va., for extensions and improvements in locomotive shops at Clifton Forge, Va., including one-story unit, 50 x 130 ft., for engine hoist and other service, enlargement of tank and erecting shops, new transfer table, etc., entire program to cost \$125,000 with equipment. C. W. Johns, Richmond, is chief engineer.

Imperial Fossil Marble Corporation, Goshen, Va., recently organized by C. L. Williams, Steubenville, Ohio, and associates, with capital of \$250,000, plans establishment of marble-working plant on over 1000 acres in Panther Gap, near Goshen, including installation of derricks, conveying and other equipment, air compressors, etc. Initial plant for cutting, grinding, finishing and other service will cost over \$85,000. Contract has been made with Virginia Public Service Co., Charlottesville, Va., for electric power service for mines and plant. W. H. Warner, Union Trust Co., Cleveland, is one of heads of new company.

Board of Education, Baltimore, plans installation of manual training equipment in new high school for colored pupils, to cost about \$425,000, for which bids will be asked on general contract early in November. Taylor & Fisher, Baltimore Trust Building, are architects; Henry Adams, Calvert Building, is mechanical engineer.

Southern Shuttles, Inc., Greenville, S. C., recently chartered with a capital of \$50,000, has leased space in a building on East McBee Avenue and will equip at once for manufacture of shuttles and other textile mill apparatus. Louis P. Batson is president; and H. E. Littlejohn, treasurer.

Bureau of Yards and Docks, Navy Department, Washington, will take bids at once for motor-driven and steam-driven air compressors for naval air station at Pensacola, Fla.

Commonwealth Marble & Granite Co., National Marble & Granite Co., and affiliated organizations, Atlanta, Ga., plan rebuilding mills recently destroyed by fire, with loss over \$125,000 including machinery. B. F. Coggins, Candler Building, is head.

Leaksville School District, Leaksville, N. C., is considering installation of manual training equipment in new two-story high and grade school, to cost about \$110,000. James W. Hopper, Leaksville, is architect.

Steel Heddle Mfg. Co., East McBee Avenue, Greenville, S. C., manufacturer of shuttles and other textile mill equipment, has awarded general contract to Potter & Shackelford, Allen Building, for a one and two-story addition, 25 x 135 ft., part of unit to be used for storage and distribution, to cost about \$30,000.

Utilities Gas & Electric Co., 22 West

Monroe Street, Chicago, is planning early erection of new butane gas plants at Gaffney, S. C., and Gainesville, Ga., each to cost about \$100,000 with machinery. Company will also build about 10 additional such plants at different points in South and West, entire program to cost over \$1,000,000.

American Hardware & Equipment Co., Charlotte, N. C., recently organized by Charles Nichols and W. L. McDonald, both of Charlotte, with capital of \$100,000, plans establishment of local storage and distributing plant for hardware supplies, iron and steel specialties, contractors' equipment, etc. W. G. Cotton, Columbus, Ga., will be one of heads of company.

Raylaine, Inc., Asheville, N. C., G. Jean Nord, president and general manager, has plans for initial unit of new works at Biltmore, N. C., one story, 150 x 400 ft., for production of synthetic fiber products, with machine shop, power house and other mechanical units, to cost about \$400,000 with equipment. It is expected to have plant ready for service early next year. Company was organized recently with capital of \$1,000,000.

## Detroit

**A**FUND of \$1,130,255 has been approved by Board of Education, Detroit, for extensions in high schools, including installation of manual training and other equipment. Units include addition to Cooley high school to cost \$385,977, Donaldson & Meier, First National Bank Building, architects, and McColl, Snyder & McLean, Penobscot Building, engineers; addition to MacKenzie high school to cost \$321,139, Malcolmson & Higginbotham, 1219 Griswold Street, architects, and engineers noted previously; addition to Denby high school to cost \$382,139, Smith, Hinchman & Grylls, Marquette Building, architects and engineers.

Sparks-Withington Co., Jackson, Mich., manufacturer of radio sets and equipment, automotive specialties, etc., has acquired plant and business of Autorad Electric Corp., Adrian, manufacturer of radio apparatus, etc. Adrian plant will be removed to Jackson and consolidated with main works of purchasing company.

Officials of General Motors Corp., Detroit, are arranging for organization of a new subsidiary to take over manufacture and marketing of a new gas-fired refrigerator unit now being perfected and which will be made under name of Faraday. New organization will work in close cooperation with Frigidaire Corp., Dayton, Ohio, manufacturer of electric refrigerators, another subsidiary of General Motors, and is understood to be planning factory unit in same vicinity.

Borin Brothers, Inc., 1635 Westminster Street, Detroit, operating an ice business, has plans for a new dry ice manufacturing plant, to cost about \$400,000 with machinery.

L. M. Cleaves Byers, Hancock, and associates have organized Portage Lake Foundry & Machine Co., with capital of \$50,000, and plan operation of works in Ripley section of Hancock. D. L. Robinson, Houghton, is interested in new company.

Western Tablet & Stationery Corp., Dayton, Ohio, has authorized removal of its branch factory at West Carrollton, Ohio, to Kalamazoo, Mich., where operations will be consolidated for a time at plant of Kalamazoo Stationery Co., another unit of Western Tablet organization. It is planned to erect new two-

story and basement plant at Kalamazoo for West Carrollton works, 100 x 300 ft., to cost over \$150,000 with machinery.

Pickands, Mather & Co., Sellwood Building, Duluth, Minn., with headquarters at Chicago, have awarded general contract to Worden-Allen Co., Duluth, for new steam power house at properties at Ironwood, Mich., to cost about \$40,000 with equipment.

Rich Mfg. Co. of California, Ltd., Los Angeles, manufacturer of pipe, fire hydrants, etc., is considering a proposal of Chamber of Commerce, Battle Creek, for removal of plant to that city. It is proposed by latter organization to raise a fund of \$80,000 for new plant unit, 150 x 180 ft., to house Los Angeles works. George B. Rich, head of Rich company, was formerly identified with Rich Steel Products Co., Battle Creek, later merged into Wilcox-Rich Corporation.

Enterprise Tool Corp., 1950 East Philadelphia Street, Detroit, has changed its name to Enterprise Tool & Gear Corp., and will specialize to greater extent in cut gears of different sizes.

## Chicago

**W**ORK will soon be started by Jones & Laughlin Steel Corp., 2250 West Forty-seventh Street, Chicago, on a one-story storage and distributing unit on adjoining site, 100 x 495 ft., to cost over \$100,000 with equipment. Headquarters are at Pittsburgh.

Board of Public Works, Colchester, Ill., plans installation of 75,000-gal. tank, centrifugal pumping machinery and other equipment in connection with extensions and improvements in municipal waterworks, entire project to cost over \$75,000. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, is engineer.

M. & L. Baking Co., 502 West Third Street, Sioux City, Iowa, has asked bids on general contract for new two-story and basement plant, 90 x 183 ft., and 31 x 58 ft., with ovens, power equipment, conveying and other machinery, to cost \$160,000. E. R. Swanson, Insurance Exchange Building, is architect.

Great Northern Railway Co., Railroad Building, St. Paul, Minn., has plans for superstructure for two new steam-operated electric power plants, at Great Falls and Whitefish, Mont., each to cost about \$85,000 with equipment. T. D. McMahon, address noted, is company architect.

Strong-Scott Mfg. Co., 413 South Third Street, Minneapolis, manufacturer of flour mill machinery, parts, etc., has awarded general contract to Pike & Cook, 416 South Fifth Street, for a one-story and basement storage and distributing plant, 100 x 360 ft., to cost about \$200,000 with equipment. Larson & McLaren, Baker Building, are architects; G. M. Orr Co., Baker Building, is mechanical engineer.

Standard Oil Co. of Indiana, 910 South Michigan Avenue, Chicago, contemplates an oil storage and distributing plant at Pueblo, Colo., to cost over \$85,000 with equipment. Company engineering department is in charge.

Board of Trustees, Yankton College, Yankton, S. D., has approved plans for power plant at institution, to cost about \$50,000 with equipment. George G. Elmslie, 122 South Michigan Avenue, Chicago, is architect.

Eastern Minnesota Power Co., Pine City, Minn., will soon take bids on general contract for a new steam-operated electric power plant at McGregor, Minn., to cost over \$75,000. R. B. Fanning, Kasota

Building, Minneapolis, is engineer in charge.

Minneapolis Gas Light Co., 800 Hennepin Avenue, Minneapolis, will soon take bids for a four-story and basement equipment service, repair, storage and distributing plant, to cost over \$150,000 with equipment. Ekman, Holm & Co., Phoenix Building, are architects.

Hormel Packing Co., Austin, Minn., meat packer, has approved plans for a six-story and basement addition, to be equipped in part as a freezer unit, to cost about \$200,000 with machinery. H. Peter Henschien, 59 East Van Buren Street, Chicago, is architect and engineer.

Federal Cement Tile Co., Chicago, has acquired American Cement Tile Mfg. Co. Executive and general offices will be at Chicago. It is proposed to change name to Federal-American Cement Tile Co.

## Cincinnati

CONTRACT has been let by American Blower Corporation, Tennessee Avenue and Reading Road, Cincinnati, to John Hoover, 808 Main Street, for a one and two-story and basement addition, to cost about \$50,000 with equipment. Headquarters are at Detroit. Russell Potter, American Building, Cincinnati, is architect.

Lakewood Engineering Co., Berea Road, Cleveland, manufacturer of road-building machinery, industrial contractors' equipment, etc., is planning removal of Cleveland division plant to Columbus, Ohio, where production will be carried out in conjunction with local plant of Jaeger Machine Co., manufacturer of similar equipment, an affiliated organization.

Kentucky Power Corporation, Louisville, and affiliated power utilities, operated by Middle West Utilities Co., 72 West Adams Street, Chicago, are arranging an expansion and improvement program during 1931 to cost over \$3,000,000, fund to be allotted by parent organization.

Board of Trustees, Tennessee Polytechnic Institute, Cookeville, Tenn., is asking bids on general contract until Nov. 6 for a two-story and basement addition, 70 x 150 ft., to cost over \$175,000 with equipment. R. H. Hunt & Co., First National Bank Building, Chattanooga, Tenn., are architects.

Columbia Gas & Electric Co., Cincinnati, operating Cincinnati Gas & Electric Co., and other electric light and power and gas utilities, is arranging for a bond issue to total close to \$60,000,000, considerable part of fund to be used for acquisition of natural gas interests and for construction of natural gas pipe lines to Virginia, New Jersey and other Eastern states.

Tennessee Cereal Co., Independent Life Building, Nashville, Tenn., has asked bids on general contract for a new two-story plant, 50 x 165 ft., with multi-story power house adjoining, 45 x 50 ft., to cost over \$100,000 with equipment. Hart & Stone, Hitchcock Building, are architects.

Soutex Machine Co., Chattanooga, Tenn., recently organized by J. W. Schimek, 2113 Ringgold Road, and associates, is considering early operation of a local plant for manufacture of new type of condensers for use in woolen mills, and other mechanical equipment.

Chatfield & Woods Co., 227 West Third Street, Cincinnati, manufacturer of paper products, has asked bids on general contract for a new one and two-story plant at Norwood, to cost over \$75,000 with equipment. John H. Deakin, 15 East Eighth Street, Cincinnati, is architect.

## Cleveland

PLANS are under way by Powerlite Switchboard Co., 4149 East Seventy-ninth Street, Cleveland, manufacturer of electric switchboards and equipment, for a one and two-story addition, 50 x 125 ft., to cost over \$65,000 with equipment. H. K. Ferguson Co., Hanna Building, is architect and engineer.

Board of Education, Auditorium Garage Building, Cleveland, plans installation of manual training equipment in three-story John Marshall School, to cost \$1,000,000, for which bids will soon be asked on general contract. G. Hopkinson is architect for board, address noted.

Ford Motor Co., Euclid Avenue and East 118th Street, Cleveland, has leased part of former plant of B. F. Stearns Motor Co., totaling about 65,000 sq. ft., and will use for expansion in local assembling plant.

Fostoria Milling & Grain Co., Fostoria, Ohio, plans rebuilding grain elevator recently destroyed by fire, with loss about \$75,000 including equipment.

City Council, Wellsville, Ohio, is arranging fund of \$25,000 for purchase of water meters for local municipal system.

Fostoria Screw Co., Fostoria, Ohio, has commenced erection of a plant addition, 80 x 150 ft., for which equipment amounting to about \$100,000 will be purchased later. Company is also revamping present plant.

## St. Louis

BIDS on general contract have been taken by St. Louis Screw & Bolt Co., 6900 North Broadway, St. Louis, for a one-story addition, 180 x 240 ft., to cost about \$250,000 with equipment. Company engineering department is in charge.

Chickasha Cotton Oil Co., Chickasha, Okla., has awarded general contract to W. E. Edmiston, Chickasha, for a three-story cottonseed oil refinery, 53 x 119 ft., to cost about \$65,000 with machinery. E. H. Eads & Co., Hall-Briscoe Building, are architects.

City Council, Hominy, Okla., has plans for extensions and improvements in waterworks pumping station, to include installation of pumping machinery engines and other equipment. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

Automatic baking machines, conveying and other equipment will be installed in ice cream cone factory to be established by Linda Baking Co., St. Louis, recently organized by Ernest A. Hamwi, 4212 Lafayette Street, and associates. Three-story building has been acquired and will be remodeled and equipped at a cost of over \$200,000.

Hastings Casket Co., 1322 West Second Street, Hastings, Neb., has plans for a two-story addition, 40 x 50 ft., for storage and distribution, to cost about \$23,000.

Municipal Water and Light Department, Hastings, Neb., has approved immediate erection of two-story addition, 62 x 82 ft., to municipal light and water plant, to cost over \$40,000 with equipment.

Sinclair Oil & Gas Co., Oklahoma City, has work under way on a new oil storage and distributing plant south of city limits, to cost over \$350,000 with equipment.

Century Petroleum Co., Petroleum Building, Oklahoma City, has approved

plans for a new local oil refinery, to cost about \$100,000 with machinery.

City Council, Fayetteville, Ark., has plans for a municipal airport on tract recently acquired, including hangar with repair shop and other field units, to cost about \$35,000 with equipment. E. M. Ratliff is city engineer, in charge.

Kansas Stage Lines, 1301 Main Street, Kansas City, Mo., has leased one-story building, 77 x 140 ft., to be erected at Sixth and Washington streets, to include service and repair division, loading dock and other terminal facilities, to cost over \$100,000 with equipment. General contract has been let to Fogel Construction Co., Reliance Building.

Kansas City Steel Foundry Corp., Kansas City, Mo., recently organized, will soon begin operations in plant of former Kansas City Malleable Casting Co., First Street and Washington Boulevard. P. M. Crone, Tulsa, Okla., is president and treasurer.

## Pittsburgh

PLANS are under way by Pennsylvania Railroad Co., Pittsburgh, for a new coaling station at Erie, Pa., with conveying, loading and other handling equipment, to cost over \$800,000. Company has awarded general contract to Rust Engineering Co., Koppers Building, Pittsburgh, for addition to grain elevator at Erie, to cost about \$400,000 with machinery.

Kier Fire Brick Co., Oliver Building, Pittsburgh, is planning new branch plant at Fort Hill, Pa., to cost over \$40,000 with equipment.

Cooling Engineering Co., Meadville, Pa., recently organized by L. A. Cowles, Meadville, and associates, with capital of \$100,000, plans operation of local works for production of cooling towers and kindred engineering equipment. Mr. Cowles will be treasurer of company. E. L. Barnhart and C. K. Strausbaugh, both of Meadville, are interested in new organization.

Berkeley Springs Industries, Inc., Berkeley Springs, W. Va., recently organized by Jack and Raymond Hunter, Berkeley Springs, and associates, plans erection of local plant for production and bottling of beverages, with division for manufacture of dispensing equipment. It will be one story, 150 x 195 ft., with cost about \$90,000, of which about one-half will be expended for automatic and other machinery. Raymond Hunter is secretary.

West Virginia Water Service Co., Summers Street, Charleston, W. Va., is considering a fund of about \$300,000 for extensions and improvements in plants and system, including pumping machinery, pipe lines, etc.

## Indiana

PLANS are being considered by Rock Insulating Co., Wabash, manufacturer of insulating products from rock materials through grinding and processing, for a one-story addition, 75 x 160 ft., to cost over \$65,000 with equipment.

Board of Public Works, Goshen, has authorized plans for a new municipal electric light and power plant to cost over \$250,000 with equipment.

Officials of Producers' Core Sand Corp., Michigan City, Ind., have arranged for a reorganization of company to carry out expansion and improve-



ments at sand-mining properties. John N. Bos and A. O. Ohlemacher, both of Michigan City, are heads.

Coca-Cola Bottling Co., Washington, Ind., will take bids at once for a new two-story bottling, storage and distribution plant, 50 x 100 ft., with installation of automatic bottling, sealing, conveying and other equipment, to cost about \$55,000. Benjamin Clawson, 503 Pearl Street, Washington, is architect.

Ra-Screen Corporation, Indianapolis, recently organized, has leased part of plant of F. H. Langsenkamp Co., 130 East Georgia Street, for manufacture of an automobile radiator screen and other automotive equipment. John Roberts, Jr., is president.

## Gulf States

PLANS are under way by Tucker Motor Co., Twenty-second Avenue, Tuscaloosa, Ala., for a two-story and basement service, repair and garage building, 82 x 210 ft., to cost close to \$100,000 with equipment. William L. Welton, American Traders' Building, Birmingham, is architect.

Conveying, elevating and other handling equipment will be installed in new warehouse and freight terminal of Louisiana & Arkansas Railroad Co., New Orleans, for which local site has been selected, to cost over \$3,000,000.

Western Natural Gas Co., 1101 Midland Building, Kansas City, Mo., is planning new natural gas pipe line from Texas Panhandle to Omaha, Neb., to cost over \$3,500,000 with booster stations and other equipment.

Cameron Iron Works, Inc., 711 Milby Street, Houston, Tex., operating a general steel and iron-working plant, has awarded contract to Truscon Steel Co., 1701 Oliver Street, for a one-story addition, 86 x 120 ft., to cost close to \$30,000 with equipment.

Kerrville Gas Co., Kerrville, Tex., has authorized extensions and improvements in plant, including installation of auxiliary machinery, engine, compressor and other equipment for artificial gas service, to cost over \$90,000.

W. T. Waggoner, Fort Worth, Tex., has begun enlargements and improvements in oil refinery at Electra, Tex., to increase present capacity from 3500 to 6500 bbl. a day, to cost over \$90,000 with machinery. W. T. Waggoner, Jr., Electra, is one of company officials in charge.

Board of School Trustees, San Benito Independent School District, San Benito, Tex., plans installation of manual training equipment in new high school to cost over \$120,000, for which bids are being asked on general contract until Nov. 4. Phelps & Dewees, Gunter Building, San Antonio, Tex., are architects. W. E. Simpson & Co., Milam, San Antonio, are engineers.

Dorgan-McPhillips Packing Corporation, Mobile, Ala., has arranged with Marion County Chamber of Commerce, Columbia, Miss., for a new canning factory at last noted place, to cost over \$65,000 with equipment. Operations will begin soon.

Magnolia Oil Co., Dallas, Tex., a subsidiary of Standard Oil Co. of New York, 26 Broadway, New York, is completing an addition to refinery at Luling, Tex., including equipment for production of gasoline, to cost over \$100,000.

All-American Airways, Inc., Miami, Fla., J. H. Wentworth, Court House Road, president, is considering erection of a new hangar with reconditioning and

shop facilities at Gratiigny Road and N. W. Twenty-seventh Avenue, to cost over \$40,000 with equipment.

City Council, Port Arthur, Tex., is asking bids until Nov. 8 for pumping machinery, engines, motors, etc., for municipal waterworks, in connection with an expansion and betterment program to cost over \$300,000. City engineering department in charge.

## Pacific Coast

PLANS are under way by Italian-American Motors Co., Inc., 604 Montgomery Street, San Francisco, for one-story plant at Sausalito, Cal., for production of marine and automobile gasoline engines, to cost over \$30,000 with equipment. McFarland & Moore, 126 Otis Street, San Francisco, are architects.

Union Public Market Co., Los Angeles, has leased one-story and basement building, 143 x 175 ft., to be erected for new public market, and will install conveying, refrigerating and other equipment; an automobile service, repair and garage building will be established. Entire project will cost about \$125,000. Balch & Stanbery, Washington Street and Vermont Avenue, are architects and engineers.

Pacific Gas & Electric Co., 245 Market Street, San Francisco, has plans for new equipment storage, service and distributing plant at Redwood City, Cal., to cost about \$60,000 with equipment. Company engineering department is in charge.

St. Helens Pulp & Paper Co., St. Helens, Ore., has awarded general contract to A. Guthrie Construction Co., Portland, for a one-story addition to mill, to include installation of a new paper-making machine and other equipment, to cost over \$200,000. Expansion is scheduled for completion in six months.

Southern Sierras Power Co., Riverside, Cal., has authorized construction of a new steel tower transmission line from Calipatria to Blythe, Cal., about 70 miles, with automatic power substation at last-noted place, and addition to power substation at Calipatria, entire project to cost \$325,000 with equipment. Company engineering department is in charge.

Western Oil & Refining Co., 555 Berry Street, San Francisco, Joseph L. Castor, representative, has acquired property at Watsonville, Cal., for erection of oil storage and distributing plant, to cost over \$70,000 with equipment.

Pacific Coast Pulp & Paper Co., Richvale, Cal., will soon begin superstructure for new pulp and paper mill, using grapevine waste as source of raw material, to cost more than \$200,000 with machinery.

Stella Brothers, 1470 Howard Street, San Francisco, manufacturers of caskets, etc., have asked bids on general contract for a three-story and basement factory, to cost over \$75,000 with equipment. Louis Mastropasqua, 580 Washington Street, is architect.

Portland Canal Power Co., Dexter-Horton Building, Seattle, has plans for a hydroelectric power project on Davis River, about 12 miles from Hyder, Alaska. Plant will have initial capacity of 40,000 hp., and will cost over \$2,000,000 with steel tower transmission, power substations and other structures. Willis T. Batcheller, Dexter-Horton Building, is engineer in charge.

B-K-V Battery Separator Co., San Francisco, has acquired mill of North Bend White Cedar Co., North Bend, Ore., with adjoining property, and will estab-

lish a new plant for battery separators and kindred equipment, to cost over \$80,000 with equipment. An addition will be built to existing unit.

Porter-Cable Machine Co., Syracuse, N. Y., has appointed Harron, Rickard & McCone Co., 1600 Bryant Street, San Francisco, as its northern California representative of Porter-Cable lathes.

## Canada

TENDERS will be called soon for an addition and improvements to filtration and bleaching plants for E. B. Eddy Co., Ltd., Hull, Que., to cost \$1,800,000. Victor Drury, 360 St. James Street West, Montreal, is president.

Cortaulds (Canada), Ltd., Cornwall, Ont., has awarded contract to Foundation Co. of Canada, Ltd., 1538 Sherbrooke Street West, Montreal, for a plant addition, 150 x 450 ft., to cost \$250,000.

Jem Rubber Co., Ltd., 3723 Dundas Street West, Toronto, will start work next spring on a factory addition to cost \$75,000. J. S. Turner, 74 Kennedy Avenue, Swansea, is architect.

Catto & Catto, architects, 1 Wellington Street West, Toronto, will call for tenders at once for a one-story factory at Gravenhurst, Ont., for Rainbow Craft Co., to cost \$35,000.

## Foreign

PLANS are under way by Southern Railway Co., Southampton, England, for extensions and improvements in property of Northampton Docks, an affiliated organization, including new wharf and dock structures, installation of conveying, loading and other handling equipment, cranes, etc. Program will cost about \$15,000,000.

Taiwan Power Corp., Tokyo, Japan, is arranging for sale of a bond issue to total about 45,000,000 yen (about \$22,500,000), part of fund to be used for extensions and improvements in power plants and system.

Industrias Albinana Argemi, Barcelona, Spain, manufacturer of lithopone and kindred products, has secured a loan of 1,500,000 pesetas (about \$300,000) from Spanish Government, fund to be used for expansion and improvements in plant and installation of additional machinery.

Ministry of Public Works, Belgrade, Yugoslavia, has approved plans for railroad, road and other public works construction, to cost about \$36,000,000, and will let contracts soon for different parts of program.

Merger has been arranged by Raffinerie du Nord, Union des Mines, and Petrofina, Ltd., all of Paris, France, operating oil properties in that country. Consolidated organization will have a capital of 100,000,000 fr. (about \$3,920,000), and plans construction of an oil refinery at Dunkirk, with initial capacity for handling about 175,000 bbl. of crude oil a month. Plant will include divisions for production of gasoline and by-products, and will cost over \$1,000,000. Consolidated organization is also considering erection of a steam-operated electric generating plant.

S. A. Potasse et Engrais Chimiques, Paris, France, recently organized as a subsidiary of Sainte Therese, Ltd., Paris, operating potash mines, is planning erection of a new plant near Rouen, for production of potassium sulphate and kindred products.

## Steel Corporation Earns \$2.06 a Share

Earnings of \$2.06 per share of common stock were shown in the report for the third quarter of 1930 of the United States Steel Corp., after providing for the preferred stock dividend. This is based on 8,677,310 shares issued as of Oct. 28. The showing compares with \$3.01 a share for the second quarter for a somewhat smaller number of shares and \$3.44 for the first quarter.

One other interesting observation may be made, that total earnings for the nine months this year amounted to \$134,672,000, whereas earnings for the corresponding periods of the other recent lean years were \$133,000,000 in 1927 and \$122,180,000 in 1924. These earnings were made in the face of prices that for the three quarters of this year, as indicated by THE IRON AGE composite steel prices, were 6 per cent under those ruling for the same period in 1927 and 15 per cent under those of 1924.

The total earnings for the third quarter were \$37,995,299. After allowance for depletion, depreciation and obsolescence and interest on bonds, the balance was \$21,782,305. This balance was increased to \$24,195,162 by special income of \$2,412,857, representing the quarterly apportionment of net interest on Federal tax refunds. The surplus for the quarter, after allowing for dividends, was \$2,704,950.

## Jones & Laughlin Net for Quarter \$1,850,837

The Jones & Laughlin Steel Corp., Pittsburgh, in the quarter ended Sept. 30, had net income, after depreciation, depletion and bond interest, of \$1,850,837. Net income of the company in the first nine months of 1930 amounted to \$8,809,533. Regular dividends of 1% per cent on preferred stock and 1% on common were declared.

## Urges National Business Body to Control Cycles

WASHINGTON, Oct. 28.—Control of the business cycle by a national organization of business men was suggested by Dr. Frank M. Surface, assistant director of the Bureau of Foreign and Domestic Commerce, Department of Commerce, in a radio talk from station WMAL here Sunday night. Dr. Surface proposed that the national organization of business men be built up by representation from regional organizations which could gather the necessary information, interpret its meaning and see that the results flowed back to business in a way that appropriate action would be secured.

The Government, Dr. Surface said, has no place in such a plan except to extend such fact-finding facilities as cannot well be furnished by other or-

ganizations. To be successful, it was pointed out, the plan must be conceived and executed by business itself. It was declared that the losses which business has suffered in the past 12 months would justify the expenditure of an enormous sum as insurance against the repetition of another such occurrence.

"It is imperative that we devote to this immensely vital task all the energy and economic wisdom at our command," he declared. "It is the greatest challenge to constructive business thinking that the world has yet witnessed."

## Threefold Merger in Air-Conditioning Field

Negotiations are practically completed for the merger of the Carrier Engineering Corp., Newark, N. J.; the Brunswick-Kroeschell Co., New Brunswick, N. J., and Chicago, and the York Heating & Ventilating Corp., Philadelphia, each one of the largest concerns respectively in air conditioning, refrigerating and unit heating and ventilating industries. Including subsidiaries, the merger will unite 15 companies, five of them foreign, with total assets of approximately \$15,000,000.

## Sees Five Years' Activity for American Shipyards

WASHINGTON, Oct. 28.—As a result of the new construction program, American shipyards are enjoying the greatest peace-time activity in the history of the industry, according to Chairman T. V. O'Connor of the Shipping Board. In bringing out this point yesterday in an address before the tenth annual Middle West Foreign Trade and Merchant Marine Conference at Indianapolis, Mr. O'Connor said that it is estimated that the expenditure of \$281,000,000 for merchant ship construction, supplemented by about \$100,000,000 for other shipbuilding work, will give American shipyards during the next

five years about \$75,000,000 worth of work annually. This volume of business, it was stated, will require the services of some 20,000 trained shipyard workers, as well as a like number of workers in various other industries, scattered throughout the country, which furnish the yards with material and equipment.

## Construction Costs Move Lower

For five consecutive months construction costs have shown a decline, as indicated by studies of the Associated General Contractors of America. Based on 1913 as 100 the index is now 198.4, and no further decline is expected.

Prices paid by contractors for materials have shown a steady decline since last March and have been dropping irregularly since April, 1929. Building wages, however, have shown no such tendency, being now higher than during preceding years, and having maintained practically a level curve during 1930.

## Foundry Equipment Orders Gained in September

Foundry equipment orders gained slightly in September over August, according to the reports received by the Foundry Equipment Manufacturers' Association from 20 manufacturers. The index figure for September was 91, compared with 85.2 in August. The average monthly shipments of 1922, 1923 and 1924 are taken as 100. The three months' average declined, however, to 90.8, the lowest of the year. The best month was February, with orders at 196.4 and the three months' average at 188.1.

Shipments declined in September, having been represented by the figure 66, compared with 82.6 in August. The index of unfilled orders at the end of September was 170.8, compared with 140.2 at the end of August.

## Newspapers in Hamelin, Germany, Please Copy

The famed pied piper of Hamelin, who lured rats by appealing to their musical appreciation, was equaled by early American inventive genius, according to THE IRON AGE of Aug. 28, 1873, which says:

"An ingenious mechanic in Pennsylvania has invented a novel trap, which is said to successfully entrap the predatory rat by exciting his selfish passions.

One of the local journals, describing the invention, says: 'A mirror is set in the back of the trap, and when the rat is out on a forag-

ing expedition, he not only espies the bait, but at the same time believes his own image in the mirror to be another rat making for it on the opposite side. This is too much for rat nature to stand and be cool over, so he rushes for the bait, and meets his fate.'"

In the seventy-fifth anniversary issue of THE IRON AGE, to appear on Nov. 20, there has been set apart what might be called the funny department, covering early inventions which represented more ingenuity than practicality.



# European Steel Prices Still Lower While Mills Negotiate Cartel Renewal

(By Cable)

LONDON, ENGLAND, Oct. 27.

**P**IG IRON is quiet, with consumers covering only immediate requirements, but the Cleveland iron output is fully absorbed and stocks are diminishing so that makers are unwilling to reduce prices.

Hematite iron is rather more active with Continental buying, but the demand is insufficient to warrant increased output.

Steel export demand is confined to small Colonial Government orders and domestic buying is poor with large consumers withholding specifications, so that mills are operating irregularly.

A Zambesi bridge contract requiring 20,000 tons of steel is expected to be placed with a Northeast Coast shop for delivery probably over two to three years.

European steel makers have continued negotiations in Paris with a view to preventing collapse of the Continental Steel Cartel. Strong efforts are being made to persuade French mills to accept a 30 per cent reduction of output, but the French declare that this would lead to the loss of important domestic and export markets and prevent the execution of their present obligations. If an agreement is not reached it is expected that the Cartel will finally collapse, a result eagerly awaited by numerous Continental producers.

Most mills are well placed with tonnage to the end of the year, but practically no orders have been

French motor car builder buys chrome-nickel steel in the United States.

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Steel Cartel continuation hinges on 30 per cent cut in French quota.

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Japan planning to buy wire rod mills of 40,000 tons capacity.

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Chilean commission studies possibility of national steel industry.

booked as yet for 1931 delivery. Steel business here is extremely quiet, but Northeast and Midland consumers have bought about 5000 tons of Belgian-Luxemburg foundry iron. Continental steel prices are weaker.

The tin plate conference is endeavoring to book orders at the full schedule price, but buyers are covering only immediate requirements. Mills outside the conference are accepting a shade less than the schedule, and merchants are booking forward contracts at still lower prices. Many mills, however, have good order books to the end of the year.

Galvanized sheets are quiet. English makers are unsuccessfully quoting India £12 per ton (\$58.32) c.&f. Belgian mills are booking only small galvanized sheet orders. Black sheets are inactive with Japanese business dull.

Le Bas Investment Trust, a reg-

istered private company with capital of £250,000 (\$1,215,000) in £1 shares will acquire at least nine-tenths of the issued capital of Le Bas Tube Co., the British Steel Piling Co., Le Bas West Africa, Ltd., and Edward Le Bas & Co.

Luxemburg output in September was 190,000 tons of pig iron and 186,000 tons of raw steel. Only 26 blast furnaces are now active. Saar output in September was 146,000 tons of pig iron, 147,000 tons of raw steel and 111,000 tons of rolled steel, with 24 blast furnaces operating at the end of September.

France has placed an order for rustless steel for motor car lamp shells with the Republic Steel Corporation in the United States, which manufactures under the Krupp-Nirosta license.

German output in September was 814,000 tons of raw steel and 578,000 tons of rolled products.

## German Iron and Steel Stocks Large

HAMBURG, GERMANY, Oct. 13.—Steel products in mill stocks at the end of September are estimated at 170,000 tons, compared with about 30,000 tons at the end of September, 1929. Semi-finished material in stock is placed at about 230,000 tons, compared with only 20,000 tons last year, and pig iron at 1,000,000 tons, compared with about 270,000 tons a year ago. Consumers' stocks show an increase in semi-finished material and

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at \$4.8665 (par)

### British Prices f.o.b. United Kingdom Ports

Ferromanganese, export.	£11 5s.	to £11 10s.	\$54.75 to \$55.95
Billets, open-hearth....	5 12½	to 6 5	27.34 to 30.41
Black sheets, Japanese specifications .....	12 5		59.61
Tin plate, per base box..	0 17	to 0 17½	4.13 to 4.19
Steel bars, open-hearth..	7 15	to 8 5	1.69 to 1.79
Beams, open-hearth....	7 7½	to 7 17½	1.60 to 1.71
Channels, open-hearth...	7 12½	to 8 12½	1.66 to 1.87
Angles, open-hearth....	7 7½	to 7 17½	1.60 to 1.71
Black sheets, No. 24 gage	9 10	to 9 15	2.06 to 2.12
Galvanized sheets, No. 24 gage .....	11 12½		2.52

### Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos. ....	£2 11½s. to £2 12s.	\$12.51 to \$12.64
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Billets, Thomas (nominal)	3 8	to 3 9	16.52 to 16.77
Wire rods, low C., No. 5 B.W.G. ....	5 2½	to 5 7½	24.94 to 26.15
Rails, light .....	6 0		29.20
Black sheets, No. 31 gage, Japanese .....	11 5	to 12 12	54.68 to 58.32
Steel bars, merchant....	4 1	to 4 2	0.92 to 0.94
Steel bars, deformed....	4 2	to 4 3	0.93 to 0.94
Beams, Thomas, British standard (nominal)...	3 16	to 3 17	0.83 to 0.84
Channels, Thomas, American sections .....	5 12	to 5 14	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ¾-in. thick .....	3 15	to 3 16	0.83 to 0.84
Angles, Thomas, 3-in....	4 1	to 4 2	0.93 to 0.94
Hoop and strip steel over 6-in. base .....	4 10	to 4 12½	0.98 to 1.00
Wire, plain, No. 8 gage..	3 15	to 3 17½	0.84 to 0.85
Wire, barbed, 4-pt. No. 12 B.W.G. ....	9 12½		2.09
Wire nails, base.....	5 15		\$1.26 a keg

pig iron, but a decrease in finished products. Smaller finished steel stocks are attributed to the recent delay in buying based on expectation of lower prices.

With business generally unimproved, the Friedrich Krupp, A. G., Essen, has dismissed another 2500 workmen this week. In the Ruhr district 6000 more iron, steel and coal workers were dismissed during the second week of October, bringing the total this month to 9000. Unless the situation improves greatly, dismissals in the second half of the month are expected to reach 10,000.

Meanwhile, financial results of the present depression are apparently not so severe in the iron and steel industry as had been expected. The Gutehoffnungshütte, A. G., Oberhausen, has proposed a 10 per cent dividend and it is not expected that any of the larger steel companies will make material reductions from last year. The smaller companies, however, will in many cases be forced to pass their dividends. The financial condition of the larger plants is attributed to mergers and modernization of equipment.

### Japan May Buy Large German Wire Rod Mills

HAMBURG, GERMANY, Oct. 13.—The Kawasaki Dockyard Co., Kobe, Japan, and another Japanese steel producer are inquiring for wire rod mills, which will add 40,000 tons to the annual capacity of Japan. Orders for this equipment are expected to be placed with German makers soon, despite the adverse attitude of the present Japanese government toward a further increase in duties on wire rods to protect the industry.

### German Mills Reduce Sheet Price for Japan

HAMBURG, GERMANY, Oct. 13.—The price for light gage black sheets for Japan has again been reduced in an effort to stimulate some business in competition with the rising volume of Japanese domestic production. Exports of light gage sheets to Japan this year are 35 per cent less than in 1929. In the past week an order for 700 tons was placed with a German mill at £10 7s. 6d. a ton (\$50.42), f.o.b. Hamburg, for shipment in three weeks.

### Chile Plans Steel Industry

WASHINGTON, Oct. 27.—A commission appointed by the President of Chile will study the feasibility of establishing a metallurgical industry, says a report to the Department of Commerce. Consideration will be given to the use of coal or electrical power to reduce the ore and manufacture steel, the most advantageous location will be selected and costs of installations and operation will be obtained.

# Buy Control of Empire Steel

Pickands, Mather & Co. Acquire Davey Interests—

Llewellyn, President

CONTROL of the Empire Steel Corp., Mansfield, Ohio, has been acquired by Pickands, Mather & Co., Cleveland, and with the same controlling ownership the Mansfield corporation is now closely affiliated with the Interlake Iron Corp. The Davey group, consisting of W. H. Davey, formerly president of the Mansfield company, and his six brothers, has sold its common stock, altogether somewhat less than 50 per cent of the total issued, to Pickands, Mather & Co. Arrangements have been made to place this stock and that of a number of the larger holders of common shares friendly to the Pickands, Mather interests in the hands of voting trustees under a trust agreement. This trust agreement will be submitted to all shareholders, giving them an opportunity to join in the arrangement.

Paul Llewellyn was chosen chairman of the board and placed in charge of the management and operation of the Empire Steel Corp. at a reorganization meeting of the board of directors Oct. 22. Mr. Llewellyn was formerly president of the Interstate Iron & Steel Co., Chicago, now a unit of the Republic Steel Corp. C. H. Henkel, Mansfield attorney, who became president on the retirement of W. H. Davey a few months ago because of ill health, will continue as president of the corporation. Frank Armstrong, a partner in Pickands, Mather & Co., was elected vice-president. J. D. Waddell continues as secretary and treasurer.

At the reorganization meeting of the company, the membership of the board of directors was reduced from 17 to 14. Five new directors were chosen: Frank Armstrong, Cleveland; C. D. Caldwell, president, Interlake Iron Corp., Chicago; James A. Garfield, New York broker and grandson of the former President of the United States; Paul Llewellyn and Fayette Brown, Harvey H. Brown & Co., Cleveland. Former directors who were reelected are: C. F. Ackerman, president, Mansfield Savings Bank & Trust Co., Mansfield; S. E. Bool, partner of Pickands, Mather & Co.; George A. Coulton, vice-president of the board of Union Trust Co., Cleveland; W. A. Thomas, C. S. Thomas and Paul Wick, Youngstown; J. D. Waddell, Niles; A. W. Wheatley, Lima, and C. H. Henkel.

The Empire Steel Corp. began operations March 1, 1928, as a merger of the Mansfield Sheet & Tin Plate Co., Empire Steel Co., Cleveland; Ashtabula Sheet Steel Co., Ashtabula, and the Falcon Steel Co., Thomas Steel Co. and Waddell Steel Co. of Niles. The six plants have an annual capacity of 400,000 tons of finished sheets. These mills are

non-integrated except the Mansfield plant, which has four 75-ton open-hearth furnaces, which for some time have been supplied with pig iron from the Toledo furnaces of the Interlake Iron Corp.

Acquisition of control of the Mansfield corporation by Pickands, Mather & Co. is the second move made by the Cleveland firm in the past year to broaden its activities in the iron and steel industry. The first was the formation last December of the Interlake Iron Corp., which owns six blast furnaces and coke plants in Chicago, Toledo, Duluth and Erie, Pa. These have an annual capacity of 1,100,000 tons. Pickands, Mather & Co. had heretofore been represented on the board of the Mansfield Steel Corp., but its financial interest was largely as a bondholder.

The new Empire organization, it is announced, plans to further develop its properties and make such additions to its special lines of sheet steel as it finds a demand for.

### Europe Buying Mexican Steel Scrap

HAMBURG, GERMANY, Oct. 13.—Mexico has recently become an exporter of scrap to European countries. In the first eight months of this year Poland imported 3088 tons of steel scrap from Mexico, Italy 1100 tons and other European countries about 1000 tons. The total taken by Europe was about six times as great as in the same period of 1929. Certain South American countries, which have not been shippers of scrap to Europe in the past, have been developing this trade, and in the first half of this year about 3000 tons was shipped to Europe, exclusive of scrap from Argentina and Uruguay, both of which have been scrap exporters for some years.

### Gain In Freight Cars Delivered This Year

WASHINGTON, Oct. 28.—Class I railroads in the first nine months of 1930 placed 70,033 new freight cars in service, comparing with 59,929 in the corresponding period of last year, according to the Car Service Division, American Railway Association. On Oct. 1 there were 6764 freight cars on orders compared with 29,481 on Oct. 1, 1929. The railroads also placed in service in the first nine months of the current year 632 locomotives as against 540 in the first nine months of 1929.



## State and City Cooperate in Trade Education of Employees

(Concluded from page 1213)

readily interpreted and production is sped up considerably. This is attributed to the fact that the men, with the increased knowledge of the products, take a much keener interest in their work. Now they know what they are doing, whereas in the past they were just going through motions. A definite addition to good-will and general morale is plainly noticeable throughout the whole force.

It is planned to continue the work during the coming year by courses dealing with the use of the slide rule, trigonometry and shop mathematics. The main course will be repeated, also, if sufficient interest to warrant the repetition develops on the part of newcomers to the factory, and on the part of those who failed to take the course this year.

On the whole, the results achieved are believed worthy of the careful notice of factory managers, as trade education may prove to be a very useful tool in the solution of factory management problems. Certainly, a man who understands the wherefore of what he is doing is a better workman than one who does not.

## Coke for Blast Furnaces

A book of 260 pages by R. A. Mott and R. V. Wheeler is being put out by the Colliery Guardian Co., 30 Furnival Street, E. C. 4, London, as Technical Report No. 1 of the iron and steel industrial research council of Great Britain. This book reports the results of the work of the Midland Coke Research Committee, composed mainly of representatives of coke users and coke producers. It is based on large scale laboratory tests made at coke ovens and blast furnaces and on research work carried out in the department of fuel technology of Sheffield University.

Part I in nine chapters deals with specifications of blast furnace coke. Part II in eight chapters deals with the manufacture of blast furnace coke to specifications. An appendix gives tabular records of tests on coke examined by the research committee. The results are reported in such manner as to show how the different properties required in coke are affected by selection and blending of the coal charge, and by conditions in coke making and handling. The book is priced at 25s. net.

## Aluminum Alloy Connecting Rods

SOME important experiments, on both a small and large scale, have been conducted by the Aluminum Co. of America in the use of aluminum alloys for connecting rods in locomotives. One or two locomotives on a Southwestern railroad have been equipped with such rods. The alloy is one of the light, high strength types, which has a tensile strength closely approximating ordinary carbon steel.

In the matter of balancing the moving weights of the rods by counterweights on the driving wheels, to reduce among other things the pounding on the rails, tests were first made on a small scale with a special mechanism. It was found that the small apparatus indicated much less pressure on the rail in the case of the aluminum alloy. As a result, full size connecting rods were placed upon a locomotive for trial in actual service and it is stated that the results have been eminently satisfactory.

## Accurate Finish for Match Plate Patterns

(Concluded from page 1215)

posite sides of the plate. In attaching the patterns, the dowel pins are first inserted in the upper half, and this is laid upon the plate to see that the pins do not foul the holes. The lower half is then assembled upon the pins, after which the screws are driven home, thus clamping the complete pattern to the plate. The gate may be either cast in one piece and fitted, or it may be built up out of separate pieces and attached to the plate by pins or screws.

Besides the advantage of extreme accuracy, a match plate made up in this manner has the added advantage that the patterns may be taken off and rearranged at will, or even combined with other patterns.

## Design and Construction of Hot Saws

(Concluded from page 1228)

consumption increases and the blade must be changed. The final worn condition, as shown in the sketch, follows about the circumference of the saw.

Use of a smooth-edge friction saw was discussed by J. M. Lewis of Joseph T. Ryerson & Son. He stated that steels in the lower carbon range—below 0.35 per cent—require saws with teeth or indentations in the blade. Above that, cold stock can be cut well with a blade of smooth edge. However, this blade must be kept cold. It has become standard practice to cool it at the rim with high-powered jets of water. A large volume of water is used, at a pressure of 100 to 200 lb. to the sq. in.

Hot sawing of round bars intended to be used in the Mannesmann process of making seamless tubing was reported by J. J. Dunn of the National Tube Co., Ellwood City, Pa. These rounds vary from 3 in. to 12 in. in diameter and from 25 to 5000 lb. or over. The saw will cut about 160 bars an hour, of 4½ in. diameter, but for smaller sizes is much more rapid, making as many as 33 cuts to the minute on 3-in. bars.

In a recent installation, the drop-saw type of frame was used, in preference to the slide frame. The latter was found liable to become blocked with chips and also it was more expensive. This saw blade has a diameter of 52 in., with 5/16 in. thickness. It is used until the diameter gets down to 46 in. and then is discarded. The initial peripheral speed is about 15,000 ft. a minute. These saws are ground every 8 hr., which means that in steady practice they cut about 16,500 sq. in. between grinds.

### How Thin Can the Blade Be Made?

Professor Trinks brought up the point that the thicker the saw blade the more power it takes to do its work, because the amount of metal removed is directly proportional to the thickness of the blade. He raised the question as to how thin a blade could be made, which would still result in a square cut. Most mills have to sell a product which can go immediately into consumption without requiring the ends to be machined—hence the necessity for a square cut.

This was answered by citing the ¼-in. thickness for a blade 50 in. in diameter as giving adequate

## Business as Others See It

Digest of Current Financial and  
Economic Opinion

THAT we are already starting the up-grade of recovery from depression levels is the opinion expressed by several commentators. Even the conservative *Annalist* sees certain favorable signs, and adds: "It seems reasonable to hope that this winter's grappling by business men with the remedial side of unemployment will furnish the most direct psychological path to the hopefully constructive attitude which is the necessary first step in the next—and coming—upswing of business activity and the general welfare."

Good business by spring is the view of Alexander Hamilton Institute. In common with other observers, this authority looks for no rapid advance. As *Financial Chronicle* puts it: "The country is now paying the penalty for the excesses of the last 10 years, and the process of recovery is necessarily a slow one."

Listing several important items as showing improvement, the Guaranty Trust Co. of New York sees a firmer tone in business activity and expects no further declines of any moment. This bank calls attention to an estimate of a decline in wages of \$9,000,000,000 a year, with a decline in wholesale prices, especially in raw materials, "considerably greater than this," but a somewhat smaller decrease

in the cost of living. Depleted purchasing power, on this estimate, "must be offset by further declines in retail prices before business recovery can take place."

"Production may increase without any rise in consumption at all," says this statement, "simply through the gradual working off of surplus stocks of goods, necessitating increased output and larger employment, which in turn will increase wage payments and stimulate consumption. It is a moot question whether either lower prices or lower wages are necessary prerequisites to trade revival."

### No Occasion for Pessimism

October pessimism is unwarranted, says Union Trust Co., Cleveland, citing definite evidence of increase in public consumption of merchandise, in residential building and in buying of basic commodities by manufacturers, and "complete exhaustion of inventories of many articles for which a renewed demand is being felt."

That shelves are becoming more and more bare is a view which is spreading. Dealers in various lines of raw materials and supplies are said by the last-named observer to be "reporting increased orders coming in from manufacturers, not only by mail but more often, in recent weeks, by wire

or telephone. Such replenishment of inventories can be interpreted only as a reflection of public demand for the finished product."

*Commerce and Finance* quotes an observant Englishman as surprised at what he calls American "avoidance of the fundamental factors that bring business depression." These he believes to be "inflation of farm land values far beyond the possible returns of farming operations, and inflation of urban values and rents. Both these overheads," he says, "must be deflated before business can really recover."

Harvard Economic Society reports a continued decline in its sensitive price index and remarks: "While this index is falling, any recovery in commodity prices is unlikely to be sustained."

But Alexander Hamilton Institute lists 11 items as evidence that business has already made some upward progress. These include: Manufacturing activity increasing since July, wage totals larger in September than in August, increased employment in 24 lines of industry, advances in machine tool orders and in residential building, more coal mined and more electric energy consumed, expansion in foreign trade and in commercial loans and the virtual stabilization of wholesale commodity prices.

rigidity. This blade was reported to operate with a small power consumption and to cool easily. In another instance, with 62-in. blades operating on structural beams of heavy section, a  $\frac{3}{8}$ -in. thickness was found to be a minimum. In this case a 66-in. saw was tried out but was not found satisfactory. However, a larger saw will shortly be needed to get outside the flanges of these heavy beams, as their weights go on increasing.

### Use of Roller Bearings on Arbors

Roller bearings of various types have been used for the arbors for a number of these saws. One swing-frame saw was reported to have operated for 27 months and then the cage of the bearing, running at 1350 r.p.m., disintegrated about like the "one-hoss shay." In this case there was considerable bending observed in the saw mandrel, also a good deal of shock.

A  $5\frac{1}{2}$ -in. mandrel was used initially, but a change was made to 7 in. and this was so carefully arranged that it would run absolutely true at 1750 r.p.m. These bearings require an elaborate circulating oil system. Another speaker reported on the use of roller bearings on two saws cutting successfully about 50,000 tons a month.

## Aluminum Alloy Propellers

A pamphlet of 16 pages, illustrated, issued by the National Advisory Committee for Aeronautics, Washington, in the shape of report No. 350, gives working charts for the selection of aluminum alloy propellers of a standard form to operate with various aircraft engines and bodies. Illustrations, including both half tones and line cuts, show how the various propeller characteristics are determined for each type of aircraft. They give the effect of wings and tail surfaces and are said to have given results very close to those obtained in service with stock planes.

## Wholesale Prices in 1929

Bulletin 521 of the United States Bureau of Labor Statistics gives wholesale prices of individual commodities in 1929, covering 550 different items month by month. Annual averages are carried for the principal groups of items from 1913 to 1929 inclusive. Index numbers are given for the same groups for the yearly averages above mentioned, and also monthly for the three most recent completed years. Further tables give the buying power of the dollar, yearly averages, for the 17 years in question, as well as monthly for the three most recent years, all based on unity in 1926.



# THE IRON AGE

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## A Perfect Barrage of Bouquets

IF we get a reader penned in a corner, look threat-  
eningly, and ask, "Now, honestly, don't you consider  
THE IRON AGE an extraordinarily useful, unusually  
attractive publication?" and he says politely, "Why,  
certainly"—it doesn't mean anything.

But, if a reader goes out of his way to laud us, if  
he voluntarily, with no axe to grind, pats us approv-  
ingly on the back, that is something else again. The  
week's mail yields these encomiums:

"We consider THE IRON AGE invaluable in our business."  
—A Connecticut metal goods manufacturer.

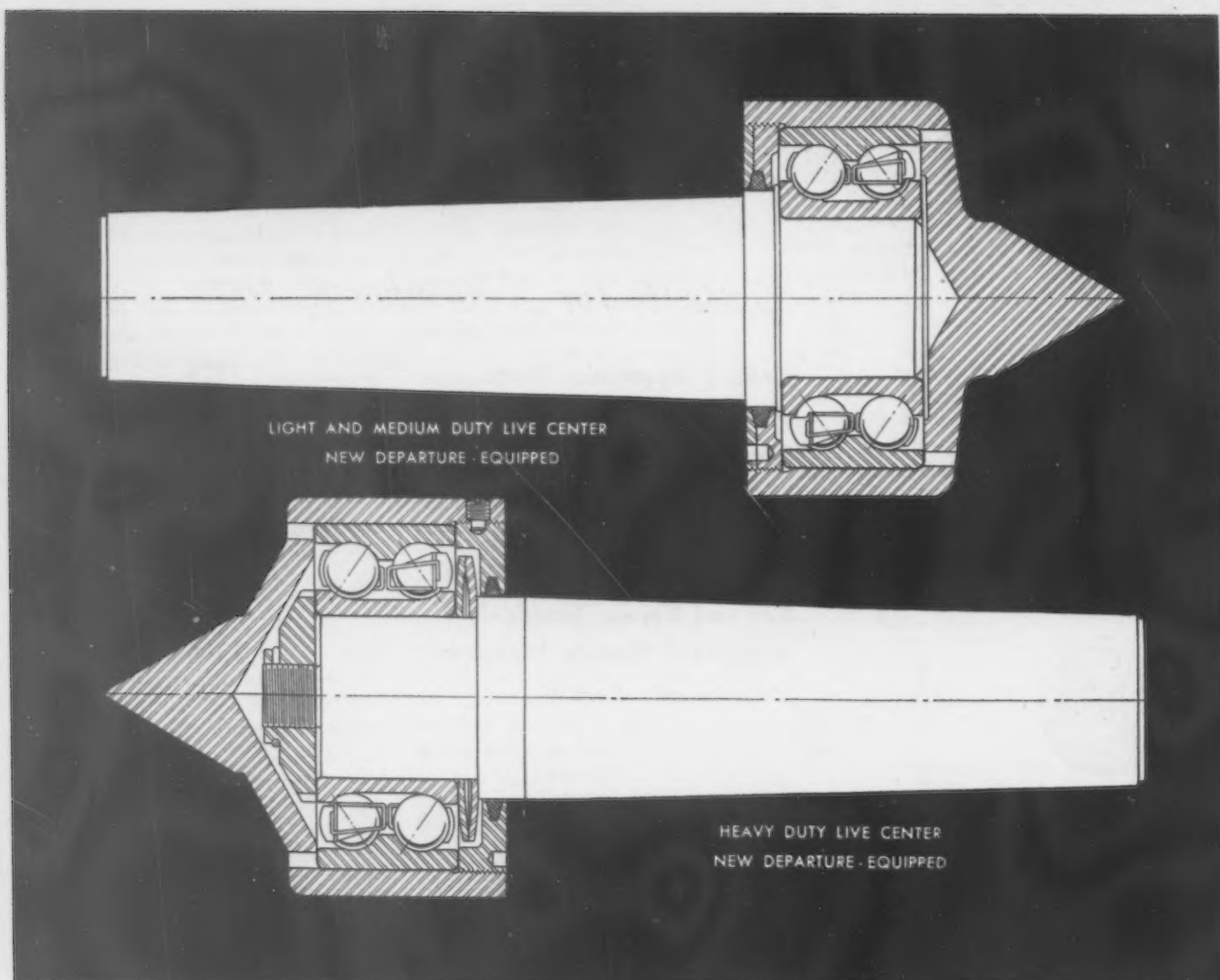
"I have been receiving THE IRON AGE regularly for the past  
three months. I am inclosing a subscription for a friend  
of mine whom I have convinced of the great value of  
THE IRON AGE."—An Illinois metallurgist.

"... the most stable and substantial carrier of information  
... routed to all our executives."—An Eastern machin-  
ery builder.

"Couldn't get along without it."—A big small tool maker.

—A. H. D.





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